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EDITED BY REGINALD W. CROWLY

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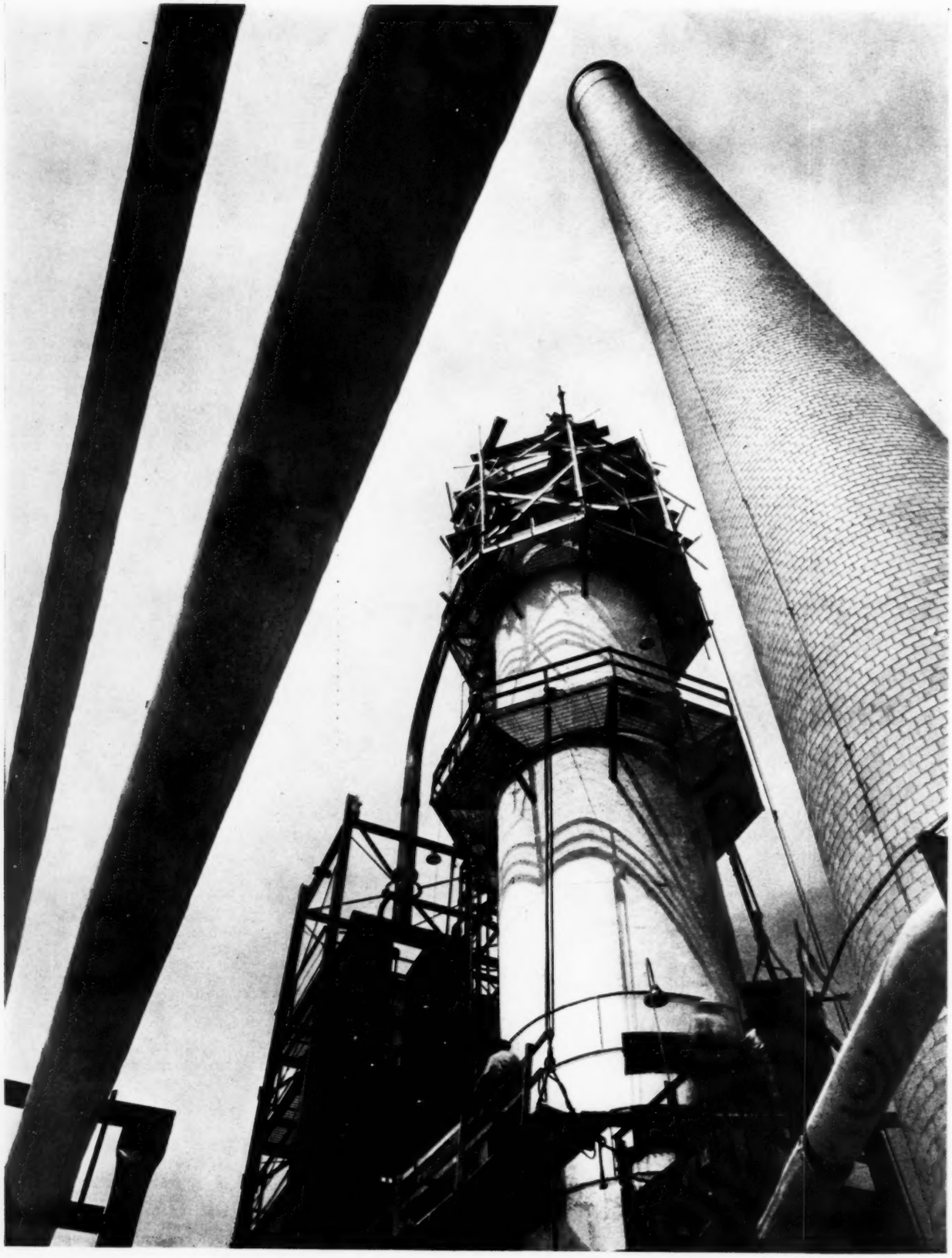

Bubble Tower, Sun Oil Co. Refinery, Marcus Hook

By M. Rittase

NEW YORK • WORLD • LONDON

PETROLEUM

U. S. Prices Prevail

INTERNATIONAL COMMERCE leads oil products from far-separated sources into competition on common ground in the importing countries and thus establishes a common basis for the oil producing and refining interests of all nations possessing an export trade in petroleum and its products. On the middle pages of this issue a striking and informative picture of the international gasoline trade is presented. There one sees at a glance why the oil companies of the world are concerned with the condition of the American oil industry, which has a preponderance of more than two-thirds of the world's crude supply and a large share of the world trade in oil products. Weakness in the American domestic market exerts its influence abroad, overriding the efforts to stabilize export prices of American products. In the annual report of the Royal Dutch Company attention is called to the natural consequence of attempts to maintain the export price level above the U. S. domestic price level. "In some instances," runs the statement, "it has even occurred that an increase in the export prices was followed by a reduction in price at the port of importation." The existing anomaly of American gasoline export prices, pegged at a considerably higher figure than U. S. domestic prices, furnishes another example of what W. C. Teagle has termed dislocated economics.

Stability Impractical

THE complete fairness of the Export Association in executing its policy was demonstrated last year when the gasoline export price was pegged just as firmly below the rising U. S. domestic market. At one time the differential amounted to an export discount of 1 cent per gallon. Stabilization of export prices may be regarded as the Association's chief object, with the dual purpose of flattening out the trading hazards of members and their customers, on the one hand, and of abolishing, on the other hand, the sharp price fluctuations that provide campaigning material for politicians in many importing countries. Were price movements confined to seasonal fluctuations or to the oscillations of equilibrant supply and demand, the stabilization would probably fulfil its dual purpose 100 per cent. World business, however, is in the final analysis a pendulum of supply and demand, swinging between surplus and shortage as human efforts are alternatively encouraged and discouraged by change of prices. Price stabilization would be practical if supply could be adjusted to demand, as seems uniquely to have been accomplished in the diamond trade and to have failed of attainment in all other lines of business. While U. S. domestic prices are liable to make long swings the Export Association policy may defeat one of its own ends. At the present time it is unconsciously furnishing a basis for the possible contention that it seeks to overcharge importing countries. The Copper Export Association's policy is not open to such criticism, because it makes the U. S. domestic quotation the basis of the U. S. export price, in accordance with sound economics.

Regulated Distribution

AN international petroleum export association would probably serve American interests better than the existing national organization, and it certainly would have the cooperation of exporters from other countries. Outside the United States, American companies have full freedom to enter into trade agreements covering international business, if the agreements do not affect U. S. domestic business. Much expensively useless competition could be abolished by mutual agreement, with provision for periodic adjustment. Grounds for price wars would be greatly reduced, even if not entirely removed. Measures would be available to make the way of the speculative interloper discouragingly hard. Actually this was all covered in Sir Henri Deterding's proposal last December to create an association of cooperation "with the assistance of such distributing organizations as are willing to cooperate, and do not let us worry about those who will not do so." Though the regulation of world production be impossible while American production cannot be restrained, the amelioration of the distributing business outside the United States certainly is not so obstructed. The complications of the world's oil trade are being increased by Russia's growing exports and will become still more involved through the same cause. It is time that measures should be taken to unify and coordinate the scattered energies now applied in the separate and individual efforts to solve problems that are in a large measure commonly encountered by all. "We must sink vanity and aim continually at sound business," said Deterding.

World Oil Production · May 1930

BOTH Russia and Rumania recorded still further advances in the month of May. The Soviet increase was about 90,000 tons (about 630,000 bbl.). This in itself is not an important amount. Its significance lies in its addition to repeated monthly increases. Since the beginning of this year the Russian monthly production has been augmented over 250,000 tons (about 1,750,000 bbl.), and the monthly increase is mounting steadily. About 30 per cent is manufactured into exports.

Rumania has seemingly climbed into fourth place among the producing countries of the world, displacing the Netherlands East Indies and Sarawak combined. The Rumanian figure is official, but the production of the East Indian islands is estimated on the basis of the February official figure—the last available. Rumania's production has been increasing steadily since the beginning of the year.

Mexico, by contrast, exhibits a further decline, its monthly production now being 50,000 tons (350,000 bbl.) below the January rate. It has fallen into seventh position, whereas it occupied fourth position at the end of last year.

		MAY, 1930	MAY, 1930
United States	A. P. I.	*80,529,600 bbl.	11,504,229 tons m.
Venezuela	official	11,641,966 bbl.	*1,663,138 tons m.
Russia	official	10,851,400 bbl.	*1,550,200 tons m.
Rumania	official	3,710,000 bbl.	*530,000 tons m.
Neth. E. Indies & Sarawak[1]	estimate	3,691,800 bbl.	*527,400 tons m.
Persia	estimate	3,608,710 bbl.	515,530 tons m.
Mexico	official	*3,350,935 bbl.	478,705 tons m.
Colombia			
Peru	official	*1,124,720 bbl.	160,103 tons m.
Trinidad	official	*779,257 bbl.	111,322 tons m.
Argentina	estimate	749,070 bbl.	107,010 tons m.
India—British	estimate	619,500 bbl.	88,500 tons m.
Poland	official	382,200 bbl.	*54,600 tons m.
Japan and Taiwan	estimate	174,300 bbl.	*24,900 tons m.
Egypt[2]	private	157,486 bbl.	22,498 tons m.
Ecuador	official	*137,928 bbl.	19,704 tons m.
Sakhalin	estimate	108,500 bbl.	15,500 tons m.
Canada	estimate	*110,000 bbl.	15,714 tons m.
Others†	estimate	175,000 bbl.	25,000 tons m.

†Germany, Iraq, France, Czecho-Slovakia, etc.
*Measure used in official returns; conversions uniformly at 7 barrels per ton.
[1]Sarawak separately about 59,750 tons m. (418,250 bbl.) [2]Anglo-Egyptian Oilfields, Ltd.

Venezuelan production was up slightly in May, compared with April. The fluctuations are considerable each month, registering variations over a range of about 200,000 tons (say 1,500,000 bbl.). The monthly Venezuelan production for the last three years is given on page 239 of this issue in a detailed official table.

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World Oil Production · April 1930

VENEZUELA proved to have maintained a lead over Russia when the Caribbean country's total for April was officially announced. The lead will probably not pass definitely to Russia until the year end.

Canada's official total was slightly under the estimate given last month. The monthly production is fluctuating about 20 per cent, with a tendency upward.

The missing Venezuelan total for March has been returned as 1,781,063 metric tons (12,467,441 bbl.), the highest figure this year and substantially equal to the December production. The April total was close to the February figure, both nearly 200,000 tons less than the March production.

It is apparent that the world production of crude this year will fall short of last year's total, due chiefly, of course, to the curtailment of U. S. production. Most of the countries are maintaining a steady rate of production, increases being shown only in a few instances.

		APRIL, 1930	APRIL, 1930
United States	A. P. I.	*77,018,100 bbl.	11,002,586 tons m.
Venezuela	official	11,131,687 bbl.	*1,590,241 tons m.
Russia	official	10,221,036 bbl.	*1,460,148 tons m.
Neth. E. Indies & Sarawak[1]	private	3,570,000 bbl.	*510,000 tons m.
Rumania	official	3,570,000 bbl.	*510,000 tons m.
Persia	estimate	3,500,000 bbl.	500,000 tons m.
Mexico	official	*3,319,303 bbl.	474,186 tons m.
Colombia	official	*1,645,242 bbl.	235,035 tons m.
Peru	official	*1,100,735 bbl.	157,248 tons m.
Trinidad	official	*790,568 bbl.	112,938 tons m.
Argentina	estimate	726,600 bbl.	103,800 tons m.
India—British	estimate	602,000 bbl.	86,000 tons m.
Poland	official	375,900 bbl.	*53,700 tons m.
Japan and Taiwan	private	168,000 bbl.	*24,000 tons m.
Egypt[2]	private	152,705 bbl.	21,815 tons m.
Ecuador	official	*139,486 bbl.	19,927 tons m.
Sakhalin	estimate	105,000 bbl.	*15,000 tons m.
Canada	official	102,335 bbl.	14,619 tons m.
Others†	estimate	175,000 bbl.	25,000 tons m.

†Germany, Iraq, France, Czecho-Slovakia, etc.
*Measure used in official returns; conversions uniformly at 7 barrels per ton.
[1]Sarawak separately about 59,750 tons m. (418,250 bbl.) [2]Anglo-Egyptian Oilfields, Ltd.

Oil Industry Arriving at Crossroads

Facts Are Not Being Faced by the Whole Industry. Divergent Views Expressed by Prominent Oil Men Becloud the Situation

By Reginald W. Crowly

THAT the peak of the 1930 gasoline selling season has been reached without an increase in price is warning to the oil industry that a price recession must follow. Lessening demand from August to the close of the year cannot uphold a summer price level. Psychology is against it. The summer habit of increasing the gasoline price had a dubious economic basis and was founded really on the psychology of the prosperity creed of the United States. Between this summer and last summer the psychology has changed: realism is supplanting optimism. Most companies have now felt the burden of the protracted overproduction from fields and refineries and have experienced the competition inseparable from excessive surplus stocks.

One of the realists of the industry, head of a leading organization, stated within the last month that he views the present situation as the most perilous the industry has ever had to face. Few are found willing to express agreement with this opinion. One even declares that "speaking generally on the oil industry, I believe it to be in an unusually good position." Yet nearly six months ago one of the leaders of the oil business ordered the operating expenses of his companies reduced by millions of dollars, the extensiveness of his retrenchment leaving no room to doubt it was for the purpose of meeting lower prices. The fact was published at the time, but little noted.

Within the last month retail gasoline prices have been cut in California, gasoline sales have been made at 5¾ cents by inland Texas refineries, Ohio crude has been cut and Pennsylvania prices still further lowered (to about one-half of the Jan. 1st figure), pipe lines are being run into the New Mexico field, new lines ordered laid from Oklahoma into Illinois and from Oklahoma into Pennsylvania and the lower central Lakes region, a town lot drilling boom threatens in Oklahoma City limits, U. S. exports dwindle while Russian and Rumanian trade registers big increases, and still the huge stocks of oils in the U. S. are held equal to between 7 months' and 8 months' supply. Evidence abounds of sharp competition now and keener competition ahead. Only the vestiges of the prosperity psychology have prevented a general reduction in the price of crude, which seasoned operators regard as overdue under present conditions.

Conditions in the petroleum industry now parallel the conditions that have prevailed in nearly all other industries. Continued overproduction induces an accumulation of stocks which weak holders have to dispose of by forced sale. Buyers of distress stock pass those price cuts along in order to make a quick turnover. Liquidation thus started among the weaker companies is generally resisted by the stronger companies until they find their sales noticeably affected. So has it been demonstrated within the last year or two in practically all world commodities, and most recently and notably in the copper business. The correction comes when the cheap producers cut the price below the figure at which all companies make money. When production becomes unprofitable it diminishes until supply declines below demand and finds a new firmness of price.

California, having the largest stocks, has been the first to demonstrate these conditions. Gasoline taxation figures in that State disclosed after the opening quarter of this year that all the first line companies, except one, had lost business compared with the first quarter of last year, though the total State sales were just about the same in the two periods. Smaller companies had captured the business by aggressive price competition. The recent cut in retail gasoline prices initiated there by a large company and followed by all the big units was a retaliatory move forced by their loss of business.

Similar competitive conditions are making themselves felt throughout the United States. They are the normal accompaniment of a period in which supply outruns demand and they always portend a decline in prices. More than any other factor they prevented the summer price increase.

On a larger scale too, they are entering into the export trade. As the spread widens between the domestic gasoline price and the export price fixed by the American Export Petroleum Association the lure of foreign shipments becomes more glittering to non-members. Today the Association export price is 2 cents or more above the free export price. This margin is delusively attractive. All overseas markets are filled, and speculative shipments just become distress cargoes, weakening the prices in the country of delivery.

Russian and Rumanian exports of oil and oil products have notably increased this year. Russian exports will probably exhibit a further increase of nearly 600,000 tons, or about 4,000,000 bbl., during the second half of the current Soviet fiscal year. Russia chiefly, and Rumania to a lesser degree, changed the aspect of the Mediterranean trade in the last couple of years. Now the Baltic markets are being disrupted by the influx of Russian oil. There is no mistaking the restrictive effect on American exports, the expansion of which is dwindling slowly but steadily month by month, except in the case of crude, until the month of May this year actually exhibited a shrinkage in comparison with May, 1929.

Domestic gasoline demand plus exports closely approached domestic production plus imports in the month of May this year, according to the latest U. S. Bureau of Mines statistical survey, whereas the former ran an average of 50,000 barrels a day ahead of the latter in May last year. Domestic gasoline consumption in the first five months of this year exceeded by 12 per cent the figure for the same period last year, but the demand on the domestic sources of gasoline supply was only 9½ per cent greater in the first five months of this year than in the same period of 1929—the difference in the two percentages is due to increased imports.

All the signs indicate that the high road of prosperity which the industry has so hopefully been following terminates in crossroads which bode no easy traveling. In a grim story, O. Henry once traced the various adventures that would have befallen a traveler down three alternative ways open to him at crossroads: the adventures were different, but the traveler's fate was always the same. So it would seem to be with the oil industry today. There are various roads open to it, but its fate is written inescapably.

SHIPPING

London · June

QUIET RULED in the tanker market up to the end of May, enquiries for all grades of tonnage having been negligible. A few fixtures were concluded at rates lower than those previously paid. For example, a 6500-ton vessel was fixed from the Gulf to U. K.-Continent ports, June/July loading at 28/–, this being about 2/– under previous rates. Demand for clean boats has fallen off, charterers' requirements seeming to be amply satisfied for the present, and in the black oil market there has been a noticeable increase in available tonnage. From Black Sea to U.K. a prompt 5000-tonner obtained 24/– for the carriage of lubricating oil. Time charter business can record a converted steamer placed for 12/18/24 months at 7/– on the deadweight, delivery in September.

No particular activity in new construction has characterized the last few weeks. Some people consider the tanker market full of tonnage and believe in particular that the Scandinavian owners who have gone in so energetically for tanker building for long term charter work are likely to find themselves with tonnage on their hands unless they have been lucky enough to fix contracts beforehand.

Records available of Scandinavian tankers which have been trading for some time indicate that from a point of view of activity they have been doing remarkably well. It will be interesting to see whether this state of affairs persists. To quote only one example, the motor tanker Beaumont which has a capacity of 8200 tons commenced trading on January 22nd, 1929. She covered 82,115 miles in her first year's trading, calling at 26 ports, dry-docking only once, and was at sea 316 days, only 49 days being spent in port. Her average speed was 10.83 knots over the total year. She has a single 6-cylinder 4-cycle B. & W. engine of 3000 indicated horsepower for propulsion.

Contracts

An order from the Thorsholm Shipping Co. has been received by Sir James Laing & Sons of Sunderland for a 10,200 ton deadweight motor tanker to have loaded service speed of about 11½ knots. This ship will be driven by a 4-cylinder opposed piston diesel engine of Doxford type. An order has been placed with the Blythswood Shipbuilding Co. of Glasgow by London owners for a 10,000 ton deadweight motorship with propulsive power of diesel type supplied by J. & G. Kincaid.

Construction

Activity continues brisk in Scandinavian tanker building business in spite of the fact that, as suggested above, the charter market may be overcrowded.

Among tankers building in Scandinavian yards at the moment mention may be made of a 9150 ton deadweight motor vessel building at Götaverken for the Waages Tankrederi II A/S of Oslo. It may be cited as an example of the way in which Scandinavian tankship construction is financed. The contract price is £128,500, of which about £45,000 is payable during construction and the balance in 12 half-yearly instalments. Subscriptions were invited recently in Norway to a new company, The Eidsiva Shipping Co., formed for the special purpose of taking over a contract for a motor tanker of 9200 tons deadweight placed with Götaverken by the Ditle-Simonsen interests of Oslo. The contract price is kr. 2,280,000 and the capital of the company is kr. 1,200,000, of which all but kr. 200,000 has been taken up by the promoters. At the statutory general meeting of the Aramis Shipping Co., held at Flekkefjord, it was agreed to take over the contract for an 11,500-ton deadweight tanker which had been fixed for a 10 years' charter party with the Anglo-Saxon Petroleum Co. The Aramis Company has a capital of kr. 700,000.

Deliveries

As regards deliveries, the week ending June 4 saw the trials and deliveries of two interesting tankers, one a steamer and one a motorship. The motor tanker is a large vessel of 14,000 tons deadweight named Pegasus and has been built and engined by Doxford's of Sunderland for Olson & Wright of Gothenburg. This ship has dimensions 430 ft. x 65 ft. x 36 ft. 9 in. The steamer is a much smaller ship, designed for service on the St. Lawrence and on the Great Lakes. Her name is Cyclo-Chief, and she has been built by the Furness Shipbuilding Co. of Haverton Hill-on-Tees for the McColl-Frontenac Oil Co. of Montreal. She is of 3900 dw.c. tons.

Russian Oil Products, Ltd., will shortly take delivery of its first coastwise tanker, Rusoilprod, and is considering tenders for two similar vessels. The new ships are to be coastwise vessels of small size, intended, like Rusoilprod, for distributing Russian oil to British coastal ports. It is expected they will be diesel driven, thereby confirming the choice of most owners of tank tonnage today for this type of propelling machinery.

As regards launchings, tankships have occupied first place amongst new tonnage put into the water during the month. A ship worth mentioning in brief here is the single screw Ebano built for the Ebano Oil Co., Ltd., of London, which was put into the water by Harland & Wolff and will shortly be delivered. She is designed for the carriage of asphalt in bulk. Cargo tanks are entirely separate from the ship's structure and are capable of being kept at a sufficiently high temperature for handling the cargo in liquid form. The dimensions of the ship are only 290 ft. x 47 ft. x 19 ft. 6 in. depth moulded. She thus compares with the Cyclo-Chief mentioned above, although of course her dimensions are not such that she can go through the Welland Canal locks.

Tanker Surgery

Attention was called in these notes in April to the surgical work on the Anglo-American Oil tanker Cadillac. This has now been completed and has excited quite an amount of interest in shipping circles. It is felt that tankers with their large parallel length of middle body are particularly suited to this type of repair work. What has been done on Cadillac may easily establish a precedent for similar work on ships of this type where heavy repair work would be otherwise necessary on the midship portion through wear and tear caused by the cargo. The whole of the work on this ship has been accomplished by Palmers Shipbuilding & Iron Co. in seven weeks. To repair the vessel in the ordinary way would, it is estimated, have entailed laying her up for 4 months, whereas the reconstruction has only occupied the short space of under 2 months. The saving effected is estimated to represent the carrying of 10,000,000 gal. of oil. The advantage of such work is that the new midship portion of the vessel can be built while the ship is still in service and the vessel need not come alongside for cutting until absolutely the last moment, thereby permitting her to keep at sea as long as possible.

A. C. HARDY.

FINANCE

London · June

HISTORY has repeated itself in the London oil share market, anticipation having proved a far more powerful bull factor than realization. Prices were sustained and many shares advanced in expectation of good annual statements by leading companies. The figures as a whole have been quite as good as the market had hoped, but, as is generally the case, profit taking has followed the fulfilment of expectations, interest has tended to evaporate and prices have failed to hold.

General stagnation in the Stock Exchange must be held partly responsible for this. News from the United States has not been encouraging. Output figures reveal no decided downward tendency in production, and conflicting reports from California have engendered doubt as to the effectiveness of output restriction there.

Share values as a whole have moved erratically, but are generally lower on balance, although some leading counters have responded to the results announced. Among lower priced shares, British Controlled preferred have been bought from time to time in anticipation of the early announcement of the promised capital reorganization scheme, and Canadian Eagles improved on the suggestion that the more promising parts of the Mexican Eagle assets, which were taken over by the Canadian Company on its formation in 1928, would provide shareholders with a dividend before long. Expectations were exceeded by declaration of 12 cents a share, but the shares failed to respond. Mexican Eagle is paying 6 per cent, the first distribution since 1922. Considerable profit improvement is indicated by both announcements. Apex Trinidad interim dividend is disappointing, being 15 per cent against 22½ per cent last. This is attributed to lower selling prices, because production remains satisfactory.

DESPITE a big increase in production, profits of Venezuelan Oil Concessions were measurably lower last year than in 1928, the figures being £1,085,666 and £1,206,430 respectively. The company markets its products largely through the Asiatic Petroleum Company, another member of the Royal Dutch-Shell group, and evidently received lower average prices.

Extensive development work on the properties was continued during the year, and new arrangements put into effect to promote efficient exploitation. One was the introduction of increased spacing between drilling locations in view of the heavy decline in production on many completed wells. Another was the investigation of possibilities of the higher oil sands above the main wells in the La Rosa—Cabimas—Ambrosio field. This proved successful, satisfactory production being obtained in certain areas.

The process of producing from wells by gaslift, as at La Rosa, was extended to the Lagunillas field. Production of several wells there was increased by this means, but the absence of high gas pressure prevented the application of the method on a large scale.

Formerly the company was the operating company of the V.O.C. Holding Company, whose shareholders recently accepted its shares in exchange for their former holdings on a share for share basis. For 1928 the Holding company paid a dividend of 22½ per cent. As 20 per cent is being paid for 1929 by the Concessions Company, the return of proprietors is slightly reduced. Capital has been increased by an issue of new shares since the accounts were made up, but there appears every prospect of the 1929 rate of dividend being maintained for this year on the larger amount now ranking. The directors announce that the agreement with Lago Petroleum Corporation and Venezuelan Gulf Oil Company remained in effect and continued to fulfil its objects of conserving oil and gas supplies and avoiding unnecessary expenditure.

THE GOOD impression made last month by the Anglo-Egyptian Oilfields dividend at 22½ per cent on the B shares was heightened by the full accounts and the statement at the meeting. Results for 1929 were the best since 1921. Profits rose by £25,000 to nearly £450,000 after making a larger depreciation allowance, commensurate with the company's activities and equipment. The new cracking plant and general extensions to refining facilities, with additions to tanker loading installations, involved heavy capital expenditure from which full benefit was derived during the later months of the year. A wider range of products has been marketed at reduced cost.

No information is available as to the result of the geological survey of Somaliland, but the company's party is returning at an early date, when a decision will be taken as to the justification for a trial boring. Excellent initial results are being obtained from the deep sand recently discovered on the eastern extension of the Hurghada Field, where a grade of crude higher than the average is being pro-

London Stock Exchange Prices

1930 High	1930 Low	1929 Div. % per Ann.	Share	May 15—June 15 First	High	Low	Last	Change
1 1/16	5/8	3½	Anglo-Ecuadorian	15/16	1	15/16	15/16	— 1/16
2 5/8	2 3/8†	22½	Anglo-Egyptian B	2 17/32	2 9/16	2 3/8†	2 5/16†	— 11/32
4 23/32	3 5/8	20	Anglo-Persian	4 7/32	4 23/32	4 7/32	4 9/32	+ 1/16
1 13/16	1	52½	Apex Trinidad (5s.)	1 3/16	1 3/16	1	1 1/32	— 5/32
2	1	7½	Attock	1 5/16	1 5/16	1 1/16	1 1/16	— 1/16
5/8	15/32	12½	Brit. Borneo (10s.)	9/32	9/32	1/2	1/2	— 1/16
11/32	9/32	7¾*	Brit. Burmah (8s.)	9/32	9/32	9/32	9/32	.....
1/4	5/32	....	Brit. Controlled ($5)	7/32	7/32	7/32	7/32	.....
3/8	1/4	....	Brit. Preferred ($5)	5/8	5/8	11/32	5/8	.....
4 31/32	3 15/32	30	Burmah	4 11/32	4 31/32	4 11/32	4 15/32	+ 1/32
11/16	17/32	12¢	Canadian Eagle (no par)	5/8	11/16	5/8	5/8	.....
1 1/2	1 1/32	....	Creole Petroleum (no par)	1 1/32	1 1/32	1 7/32	1 1/16	+ 3/32
1/2	1/4	....	Kern River (10s.)	1/2	1/2	1/4	1/4	.....
2 31/32	1 23/32	12½	Lobitos	2 13/32	2 7/16	2	2 1/16	— 11/32
3/4	9/16	6	Mexican Eagle ($4 Mex.)	21/32	11/16	5/8	5/8	— 1/32
68½	51	....	Pan American B. ($50)	68	68	59½	59½	—8 ½
11/16	1/16	2½	Phoenix	19/32	19/32	3/16	3/16	— 1/32
35 1/4	30 15/16	24	Royal Dutch (100 fl.)	33 5/8	33 5/8	32 3/4	32 3/4	—1 1/4
4 31/32	4 3/8	25*	Shell Transport	4 27/32	4 7/8	4 3/4	4 25/32	— 1/16
1/2	13/32	4	Steaua Romana	7/16	7/16	7/16	7/16	.....
3 7/8	2 27/32†	30	Trinidad Leasehold	3 1/16	3 1/16	2 27/32†	2 27/32†	— 11/32
3/8	5/16	....	Utd. Brit. of Trinidad (6s. 8d.)	11/32	11/32	5/16	5/16	— 1/32
3 1/16	2 19/32	20	Venezuelan Oil Concessions	2 29/32	3 1/32	2 5/8	2 5/8	— 9/32

Nominal value of shares £1 unless otherwise indicated by bracketed figures.
*Denotes tax-free Dividend. †Denotes ex-dividend price.

duced. This extension gives a promise of further potential production, apart from which the field shows no sign of approaching exhaustion.

The position as a whole indicates the probability of maintenance of the company's prosperity. Selling prices may be lower, but the sales are evidently well conducted by the allied undertakings of the Shell group, and further advantages from plant improvements should be derived.

BY ANNOUNCING the record profit of £3,437,472 for 1929, the directors of the Burmah Oil Company provided the market with the strongest stimulant it has had for a long time. For 1928 the figure was only £1,479,626. The significance of last year's improvement is increased by the fact that depreciation allowances on refineries, pipelines and tankers, deducted prior to striking profits, were considerably larger. Allocation of the amount available is conservative, total reserve transfers being increased from £370,000 to £670,000, and an additional £500,000 is used to write down the book value of holdings in subsidiary companies. Shareholders, however, are getting a final dividend of 20 per cent, making an aggregate distribution of 30 per cent against 20 per cent previously.

This company provides an example of the value of widespread operations in offsetting low prices and difficult trading conditions. Last year it had the benefit of freedom from the price war in the Indian kerosene market and fairly steady prices in many principal selling areas. Like other undertakings interested in refining and marketing, the company had the advantage of a rise in British petrol prices in 1929. Profits were also assisted by a larger return on the company's holding of Anglo-Persian ordinary shares and a dividend on its Shell Transport shares purchased towards the end of 1928. Economies achieved in many parts of its organization were a contributory factor.

The report states that political unrest and economic depression in India have not so far had any prejudicial effect on operations, but the directors are not prophesying as to the future. Their attitude goes far to explain the cautious lines on which last year's profits have been allocated.

ANGLO-PERSIAN OIL shares relapsed heavily after the issue of the profit and dividend statement for the year to December 31 last. The reason was the absence of any announcement of a share bonus such as had been expected in many quarters. Earnings were satisfactory enough, reaching the new high level of £5,206,762 and providing a total dividend of 20 per cent. The comparable figures for the preceding period of nine months were earnings of £2,832,958—at the rate of £3,777,277 per annum—and a dividend of 12½ per cent per annum. Extra depreciation provided is on a relatively higher scale, and reserve transfers of £1,800,000 now proposed contrast with £600,000 a year ago. Larger profits are attributed to the popularity of the company's new B.P. motor spirit and to benefits derived from cooperative marketing arrangements with the Royal Dutch-Shell group in the East. The company, in which the British Government holds a big interest, has shareholdings in a wide range of companies engaged in all branches of the petroleum industry.

LOBITOS OILFIELDS dividend of 12½ per cent for 1929, although exceeding the 1928 figure by 2½ per cent, was classed as a disappointment to the optimists, and the shares have not regained their recent high quotation. Formerly a direct producer, this undertaking is now largely a holding concern. Its principal investment is in a local producing company. Other interests include Anglo-Ecuadorian Oilfields, Andian National Corporation and International Petroleum Company. It has also developed a tanker business which assists marketing of crude and brings additional revenue from outside charterings. The policy of the Peruvian company has been to maintain production without making special efforts to increase it. This policy was continued, but largely owing to a rise in the basic price of oil fixed under the company's sliding scale selling contracts, a big improvement in profits was recorded in Peru. Other interests of the Lobitos company also did better than in the preceding financial year. Contract prices for selling oil are now at a lower level, and the chairman described them at the meeting as quite unprofitable. The company has no refining business, but in view of its very strong financial position it is regarded as possessing good prospects when the petroleum position improves and production can be expanded to meet increased demands.

BRITISH BURMAH PETROLEUM COMPANY has been very unfortunate in the matter of taxation. Announcing an interim dividend of 1½d. per share net, against 2½d. a year ago, the directors explain the reduction by reference to the heavy tax imposts of the Indian Government. At the last annual meeting in December the chairman referred to the large sums paid by the company for excise duty on kerosene and petrol, royalties and Indian income tax and super-tax. These exceeded in the aggregate the amount available for dividends in the financial year to July, 1929. Shareholders are now informed that an increase of 50 per cent in the excise duty on indigenous kerosene, with a reduction in the duty on the imported commodity, are estimated to reduce the revenue of the undertaking by £50,000 per annum. Profits were maintained during the first six months of the current financial year, but the new taxation will affect earnings for the half-year to July 31 so heavily that a lower return to shareholders has become necessary. Total distribution for 1928-29 was 7½d. net on each 8s. share, equivalent to a fraction over 7¾ per cent. Profits for that period were 155,-818, a figure in which a big hole would be made in a full year by the new taxation scale now in force.

A. H. DAY.

New York · June

DOWNWARD movement of security prices has continued to the point of eliminating the advances of the earlier months of the year. In many cases the panic levels of last fall have been broken through. Just as there was a year ago an excess of optimistic enthusiasm there is now a dense cloud of gloom surrounding the market. Prices have been readjusting themselves to a postponement of the return to prosperity. How far this process will carry cannot be forecast. There is abundant cause for confidence in the longer range future. Such factors as overproduction and falling commodity prices will run their course and be corrected.

Oil shares, as indicated in the tabulation, have not escaped the general liquidation. This group faces also the uncertainty engendered by continued heavy refinery runs and consequent failure to reduce stocks of gasoline at the normal rate for this season. Crude producers are doing relatively better in controlling operations, but whether the industry can escape the breakdown of prices and profits which goes inevitably with excessive gasoline stocks appears doubtful.

CONSOLIDATED net income of Pan American Petroleum & Transport for 1929 amounted to $9,825,992 in comparison with $10,071,576 earned in 1928. Per share of combined common and class B common these figures equal $2.92 and $3 respectively. The new refinery at Aruba was not brought into complete service until February of this year, and savings from its operation will be more completely reflected in the current year's earnings. The conservative accounting practise of the management is witnessed by the 1929 deduction for depreciation and depletion amounting to more than $16,500,000, and

by net property account of about $187,000,000 after reserves totalling $133,111,000. Cash and call loans were almost equal to total current liabilities of $15,420,000, while total current assets equalled almost $55,000,000. The company is more than 80 per cent controlled by Standard Oil Company (Indiana).

The trend toward further merger and consolidation in the industry is discernible in other recent developments. Pan American Petroleum & Transport has purchased for $5,000,000 the Tide Water Oil Export Corporation, a wholly owned subsidiary of Tide Water Oil Company. Tide Water Export operates chiefly in South America, concentrating in Argentina and Brazil where it is an important distributor of gasoline and lubricating oils. Pan American's new 90,000 barrel refinery at Aruba, Dutch West Indies, will make expansion into the South American markets for refined products a logical and economic development. It is also rumored that the company contemplates expanding its European operations materially. In the past it has been an important factor in the fuel oil markets only.

New York Stock Prices

1930 High	1930 Low	Current Div. $ per Annum	Stock (Par Value $)	Sales (Shares)	May 19—June 21 First	High	Low	Last	Change
51⅜	30⅛	†2.00	Atlantic Refining (25)	195,000	43	44	30⅛	33⅛	—10
34	20½	†2.25	Barnsdall, A. (25)	144,300	26⅝	27⅜	21	21½	— 5⅛
8¼	3½	....	Colon Oil (No)	7,800	5½	5½	3½	4	— 1¾
30½	18⅜	....	Continental Oil (No)	288,800	27⅛	27⅞	18⅜	19⅛	— 8⅜
7⅜	5½	....	Creole Petroleum (No.)	73,300	6	7⅜	5½	6	— ⅜
166⅞	119	1.50	Gulf Oil Corp. (25)	58,200	151½	152½	119	120	—30½
119	78	2.00	Humble Oil & Ref. (25)	50,200	104½	105¼	83½	86¾	—18¼
30	18⅛	0.50	Imperial Oil (No)	36,300	25⅛	25⅞	18⅛	19¼	— 6¼
28⅜	8¾	....	Indian Refining (10)	288,200	19¼	19⅝	8¾	10⅜	— 9
24	17⅝	1.00	International Petr. (No)	82,200	21	21¾	17⅝	18	— 3
26½	21¼	....	Lago Oil & Trans. (No)	8,200	24½	24⅞	22½	23½	— 2
37	16½	....	Mexican Seaboard (No)	465,100	28⅛	30⅞	16½	17⅞	—10⅜
67½	50½	....	Pan Amer. P. & Tr., B (50)	71,900	64½	65½	54½	54⅝	—10⅝
44¾	29½	**2.00	Phillips Petroleum (No)	305,200	39½	39½	30¼	31⅛	— 8⅛
54	36	2.00	Prairie Oil & Gas (25)	31,200	47	47	36	37	—10½
27¾	20	1.50	Pure Oil (25)	134,600	24	24	20	20⅛	— 3⅝
28¼	14¾	2.00	Richfield Oil (25)	134,800	23⅛	23⅛	14¾	15½	— 7⅝
56½	49⅛	*3.20	Royal Dutch (N. Y.) (13⅓)	75,500	53⅛	53⅞	49⅛	49¾	— 3⅝
25½	18	1.40	Shell Union Oil (No)	112,600	21½	21⅝	18	18⅜	— 3⅜
32	20⅝	2.00	Sinclair Consol. (No)	541,100	27⅝	29½	20⅜	21½	— 6⅛
42	28⅞	2.00	Skelly Oil (25)	82,300	34¼	36⅞	29½	29½	— 5½
75	55½	2.50	Std. Oil of Calif. (No)	180,900	70	71¼	57	58	—12
59⅞	48¼	2.50	Std. Oil of Indiana (25)	241,000	54⅝	54¾	48⅛	49¼	— 5¼
40½	30⅛	1.60	Std. Oil of Kentucky (10)	61,400	35⅝	37	30⅛	31⅜	— 4⅛
84⅞	58	†2.00	Std. Oil of New Jersey (25)	1,657,500	78⅝	80⅞	60⅜	62¼	—16¾
40⅜	30⅛	1.60	Std. Oil of New York (25)	252,900	36⅜	37½	30⅛	31⅛	— 5½
70	50	§1.00	Sun Oil (No)	7,800	65	67½	50	57	— 8
60½	50⅛	3.00	Texas Corp. (25)	192,300	57⅛	59⅛	50⅛	51½	— 6⅜
17⅜	10¾	0.60	Tide Water Assoc. (No)	270,300	16½	17¾	13½	13¾	— 3⅛
24	16¼	# .30	Transcontinental, new (No)	381,500	21	21	16⅝	17½	— 3¼
50	37	‡2.00	Union Oil of Calif. (25)	41,300	45⅜	45⅞	37	38	— 7¼
97⅞	76¼	†4.25	Vacuum Oil (25)	80,200	89⅜	94¾	76¼	79	—10⅝
4½	2¼	....	Venezuelan Petr. (5)	12,400	3¼	3⅜	2¼	2½	— ⅛

[Since close of last month's table. †Including extras. ‡Plus 4% in stock. #Initial dividend. §Plus 9% in stock. *Paid last year—no regular rate. **Plus 5% in stock.

GULF OIL CORPORATION and the Mellon interests which control it have organized the Union Gulf Corporation to construct a major pipe line system to connect Gulf lines in Oklahoma with new refineries to be built by Gulf at Pittsburg, Pa., Cincinnati and Toledo, Ohio. The nominal share capitalization of 1000 shares will be owned 45 per cent by Gulf and 55 per cent by the Mellon interests. Union Gulf has sold $60,000,000 of collateral trust sinking fund 5% bonds to mature July 1, 1950. They were offered at 99 and accrued interest to yield 5.08 per cent. The collateral, with a present market value above $80,000,000, includes 200,000 shares of Pullman, 140,000 shares of preferred and 200,000 shares of common of Aluminum Company, 60,000 preferred of Pittsburg Coal, 60,000 shares of Pittsburg Plate Glass and 30,000 shares of U. S. Steel. Gulf Oil is to operate and manage the new properties and will pay Union Gulf $6,000,000 a year for the privilege. Union Gulf has agreed to pay no dividend on its capital stock while any of the bonds are outstanding, and will sell all its assets to Gulf at any time on or before June 30, 1950, at the latter company's request, for a sum sufficient to pay the debts of Union Gulf and net its stockholders 5 per cent on their investment.

Competition for gasoline business in the middlewestern states east of the Mississippi has been growing more and more keen, and Gulf is determined to entrench itself more strongly by obtaining the advantages of pipe line transportation and conveniently located refineries. The recent acquisition of Paragon Refining, which operates largely in Ohio and Michigan, was apparently part of the general expansion program. This purchase was made through Gulf Refining Company, subsidiary of Gulf Oil Corporation, and involved $10,000,000 in cash.

STANDARD OIL COMPANY of New Jersey controls the Ajax Pipe Line Company, which is building a 400 mile pipe line from the Glenn pool in Oklahoma to St. Louis. This 10-inch line will have capacity of 65,000 barrels a day and will have access by connections to other Oklahoma oil fields. This will further relieve Standard from dependence on Prairie Pipe Line for crude supply and, in connection with the reports that the Rockefeller interests have disposed of most, if not all, of their Prairie Pipe holdings, may be viewed as another development favoring the merger of Sinclair Consolidated with Prairie Oil & Gas and Prairie Pipe. Merger negotiations between Sinclair and Prairie Oil are officially stated to be still in progress, and it is generally believed in oil circles that Prairie Pipe will be brought in if a satisfactory plan can be worked out.

DIRECTORS of Ohio Oil Company and Transcontinental Oil Company have approved a plan for acquisition of the latter by the former, and special stockholders' meetings to act on the proposal will be called soon. Under the plan Ohio Oil common will be split two for one. New shares will be issued for the Transcontinental properties in the ratio of four-sevenths of a new share for each present Transcontinental share. Ohio will assume all liabilities of the acquired company, and Transcontinental stockholders will have distributed to them the Ohio shares received in consummation of the deal. Applications will be made to list the new Ohio Oil common on the New York Stock Exchange, and a $2 dividend rate is expected to be established, equivalent to the present $4 rate. Earlier this year Ohio Oil acquired Illinois Pipe Line Company through exchange of three shares of preferred for each Illinois common share.

A GROUP OF Tide Water Associated officials is reported to have purchased a block of the common stock of that company, amounting to 20 per cent of the outstanding shares. The purchase was from the Standard Oil Company of New Jersey, which secured them through exchange of its 40 per cent interest in Tide Water Oil when that company merged with Associated Oil to form the present Tide Water Associated. Although rumors of pending merger of Tide Water Associated and Continental Oil have been denied by officers of the company, the sale of stock reported above is viewed in some quarters

as clearing the way for this or some other important merger development.

PURE OIL COMPANY reported $6,539,-521 consolidated net earnings after all charges for the fiscal year ended March 31, 1930. This is equal after preferred dividends to $1.51 a share on 3,038,370 shares. For the previous fiscal year net amounted to $11,224,080, equivalent to $3.05 per common share. During the fiscal period net plant account increased about $15,500,000 after depreciation and depletion charges of more than $9,500,-000 to a total of $170,749,000, while funded debt increased $19,000,000 to $38,-000,000.

NET EARNINGS of Indian Refining for the second quarter are estimated at 46 cents per common share, which would offset the net loss of the first quarter and leave six months net equal to 35 cents a share. Considerable effort has been devoted to developing the new Havoline lubricating oils manufactured by the Govers process, which are now being introduced to the trade nationally. To reimburse the treasury and strengthen working capital, an issue of $3,500,000 of 5½% two and one-half year gold notes was recently sold at a price of 99¼ and accrued interest, to yield 5.80 per cent.

RICHFIELD OIL COMPANY of California reported consolidated net for the first quarter equal to 31 cents per share of common after all charges and preferred dividends, in comparison with 91 cents a share earned in the same quarter of 1929. Net sales figure was not reported as in previous two years, but it is probable that the decline in net was due to smaller profit margin, particularly in the territory along the Atlantic seaboard, into which Richfield has only recently expanded operations. James A. Talbot, chairman of the board, stated that no change in the present dividend rate was contemplated by the board.

ACQUISITION of Pierce Petroleum by Sinclair Consolidated, referred to in these columns last month, was approved June 12 by Pierce stockholders. Lack of adequate crude production and the high cost of acquiring it constituted the chief incentives for Pierce to accept the merger. Sinclair obtains distribution facilities supplementing its own, so that complete coverage is secured from the Gulf of Mexico to the Great Lakes in the whole middle-western section of the country. Pierce marketing facilities in Mexico handle about 25 per cent of the petroleum marketing business of that country.

C. C. BAILEY.

Paris · June

ASTRA ROMANA, affiliated to the Royal Dutch Co. in Rumania and having also many French shareholders, has decided to pay a dividend of 10% this year instead of distributing new shares to shareholders in lieu of dividends as it has done for some years. Capital is also to be increased from 1,356,000,000 lei to 2,034,-000,000 lei, (about 12,000,000 dollars). The Company holds an important position in Rumania. Production amounted to 2335 tons per day in 1929, i.e. a total of 852,372 tons (about 6 million barrels) during the year. Figures for the first four months of 1930 show a daily average of 3149 tons which the company hopes to maintain during the year. The financial situation of the company is excellent, reserves and depreciation being well covered by the sum of 1,110,379,950 lei in 1929. Gross profits were 2,143,958,657 lei.

STANDARD Franco-Américaine shareholders are being asked to approve increase of the existing capital of frs. 60,-000,000 to frs. 200,000,000. The company is regrouping the French business concerns it controls or is interested in.

Standard F.-A. first took a controlling interest in the Soc. L'Economique, then it absorbed the Soc. La Petroléenne, and now the Soc. André Fils and its affiliated Company Quervel Frères are also to be associated with the Standard Fr.-A. André Fils is the biggest French distributing organization for lubricating oil, and has a selling capacity of roughly 80,000 tons per annum. These companies will be amalgamated with the Bedford Petroleum Co. which also distributes lubricating oils to the extent of 65,000 tons per annum. This arrangement enables the Standard Franco-Américaine to control 150,000 tons of the 250,000 tons of lubricating oils consumed by the French market.

A further reason for increasing the existing capital is undoubtedly the necessity of financing the refinery which the company proposes to build at a place situated on the Seine called Port Jérome, where they will also have to build oil wharves, etc.

Standard Franco-Américaine is controlled by the Standard Oil Co. of New Jersey and is financially seconded by the Banque de Paris & des Pays Bas—one of the most powerful business banks in France. It has undertaken exploration work in North Africa and has connections in Poland and Czecho-Slovakia.

COMPAGNIE Industrielle de Pétroles, which ranked fifth amongst the French petroleum sales organizations before it was controlled by the Vacuum Oil Co. reports net profits for 1929 as 10,016,964 francs, and a dividend of frs. 40 is to be distributed. The company's balance sheet reveals the following items: depreciation frs. 36,810,645, available funds frs. 34,503,810, investments frs. 19,658,632, stocks frs. 72,796,553 and debts frs. 81,-222,131 frs., all these figures being larger than those of the preceding year. Interests in North Africa have been developed recently and distributing organizations established. It is rumored that the C. I. P. has bought a controlling interest in the Soc. Belpétrole-France which has a distributing capacity of 30,000 tons per annum.

E. J. ANDRÉ.

Paris Bourse Prices

1929 Div.	1929 Par	Share	May 1—May 31 First	High	Low	Last	Change
50 lei	500 lei	Astra Romana	261	261	154	157	—104
.....	500 lei	Colombia	170	176	146	146	— 24
50 lei	500 lei	Concordia	154	154	133	133	— 21
.....	500 frs.	Crédit Gal. des Pétroles act.	900	900	805	806	— 94
.....	.....	Crédit Gal. des Pétroles parts	10500	10500	9175	9175	—1325
.....	500 frs.	F. Polonaise des Pétroles act.	162	165	146	146	— 16
.....	.....	F. Polonaise des Pétroles parts	630	630	550	550	— 80
$1	$10	Franco Wyoming	580	580	510	510	— 70
30 frs.	500 frs.	S.G. Huiles de Pétrole act.	575	640	500	595	+ 25
.....	.....	S.G. Huiles de Pétrole parts	251	325	251	281	+ 30
.....	500 frs.	Cie. Fse. des Pétroles	990	1004	945	950	— 40
50 frs.	500 frs.	Cie. Indus. des Pétroles	1010	1010	975	975	— 35
.....	500 frs.	Lille Bonnières priorité	1160	1215	1195	1195	+ 35
.....	500 frs.	Lille Bonnières ordinaires	790	790	780	780	— 10
.....	500 frs.	Malopolska act.	329	334	290	290	— 39
.....	.....	Malopolska parts	2735	2735	2390	2415	—320
.....	.....	Mexican Eagle	166	171	158	161	— 5
17.50	250 frs.	Omnium Internat. Pétroles	238	238	161	171	— 67
50 frs.	500 frs.	Péchelbronn	1025	1060	1005	1010	— 15
60 f. b.	500 frs. bel.	Pétrofina	725	725	617	617	—108
240 fl.	1000 fl.	Royal Dutch	42500	42500	40700	41350	—1150
24 fl.	100 fl.	Royal Dutch 1/10	4275	4275	4060	4130	—145
5 sh.	£1	Shell	605	605	575	600	— 5
25 frs.	500 frs.	Steaua Française	314	314	285	295	— 19

Royal Dutch Company's Report

Deterding Points to Overproduction of Crude and of Oil Products, to Lower Selling Prices, and to Higher Operating Costs as Principal Factors in Diminishing Profit per Ton

DIVIDEND of 24 per cent paid on ordinary shares (common stock) in the two previous years, was maintained by Royal Dutch as a result of 1929 operations. Sir Henri Deterding, however, indicated that increasing burdens imposed on the oil industry, from within as well as from without, are responsible for a continually diminishing profit per ton.

Because operations of the Royal Dutch subsidiaries extend to practically every major field in the world the annual report of the company has become a classic annual review of world oil conditions. For this reason the 1929 report issued in June is published below in extenso, except for the introduction presenting the recommendations made by Sir Henri Deterding in his address to the A. P. I. in Chicago last December and except for the 1929 world oil production (vide World Petroleum, Feb., 1930, page 16) and 1929 Royal Dutch production (vide World Petroleum, Feb., 1930, page 29). The report reads:

Chemical Operations

Again in the past year the most modern methods have been applied both in production and in refining, whilst by a systematic exchange of data between our various installations all over the world these have been kept entirely up to date.

The plant at Velsen (Holland) for the manufacture of fertilizers, which was built in conjunction with the Koninklijke Nederlandsche Hoogovens en Staalfabrieken (Royal Dutch Blast Furnaces and Steel Works), has in the meantime been brought into operation at full capacity, and the products manufactured, which are marketed partly through our existing distributing organizations, have found a ready sale.

The experience gained in this direction has induced us to build a similar plant in California, where the natural gas from the oilfields constitutes an important basic material. It has further been decided to undertake the manufacture of various other chemical products from the surplus gas.

Frequent reference has been made in previous reports to inventions of processes for the manufacture of synthetic benzine either from coal or from oil to which we have given the greatest attention. It has now been decided to pool our interests with those of the Standard-I. G. combine in order to exchange experience and patents in this direction and to work the hydrogenation patents jointly. By combining with other interested parties, some of which are large chemical industries, all further inventions and improvements will be concentrated in one central body and thus this process, by which high grade products can be made from greatly varying raw materials, can be applied on the widest possible scale.

Business Conditions

A striking feature of the year under review has been the fact that the overproduction of crude oil and its derivatives caused the selling prices in various importing countries to drop to a level below the figure representing the export prices in the countries of origin plus freight to ports of importation and all other charges. In some instances it has even occurred that an increase in the export prices was followed by a reduction in price at the port of importation.

Neither did the rise in tank-steamer freight rates reflect itself in higher selling prices of the products carried.

Generally speaking it may be said that 1929 was a year of excessive competition and that in consequence some petroleum companies saw their profits diminish.

Marine Transportation

Our fleet, supplemented by chartered vessels, was continuously in service. At the close of the year our group employed nearly 2,000,000 tons carrying capacity, including the fleet of the Eagle Oil Transport Co., Ltd.

The cargo transported by this fleet in the year under review amounted to 16,000,000 tons in round figures, including 2,875,000 tons of the Eagle Oil.

Towards the end of the year orders were placed for seven small motor-ships of 2000 and 3600 tons loading capacity, destined to replace gradually the older coasting vessels.

Further orders were placed in the beginning of 1930 for twenty motor-ships of 11,500 tons loading capacity, which are to be ready in 1931.

Operating Results

The working results of the past year were again satisfactory. In January last an interim dividend of 10% was declared, and it can now be stated that the net profits for the year 1929 amounted to *f*126,471,391.43, which, after paying 4% on the preference shares and 4½% on the priority shares, allows of a final dividend of 14% (total 24%) on the capital entitled to share in the profits for 1929.

It will have been noticed that in the last few years the profit per ton of oil produced has been decreasing. This is due to various circumstances (apart from competition). In the first place the fact that the whole industry is being conducted on an increasingly scientific basis necessarily involves much higher salaried employees both in the production and in the refining of the crude oil. Further, present day methods of retailing the products to the public result in the cost of distribution forming a factor of increasing importance, whilst last but not least the sums which have to be paid in taxation either in the form of import duties or as direct taxes are assuming ever greater proportions. By way of illustration it may be mentioned that whereas in 1928 our group distributed among all shareholders *f*164,400,000
salaries and wages absorbed *f*320,240,000
and duties and taxes (not including consumption taxes) *f*293,760,000

In regard to the chief sections of our industry we give the following particulars:

Dutch East Indies

In the month of September, 1929, the People's Council passed bills authorizing the East-Indian Government to enter into several working agreements with the Bataafsche Petroleum Maatschappij on the basis of Art. 5a of the Indian Mining Act in respect to a number of fields in Atjeh and Dependencies, Palembang, West Java, East Java, the Southern and Eastern Departments of Borneo, and the Moluccas.

Crude oil production:

	1929	1928
	Metric tons	
Sumatra	1,138,068	758,224
Borneo (excl. Tarakan)	1,621,626	1,348,385
Tarakan	1,171,700	1,304,399
Java	620,988	455,086
Ceram	45,172	40,305
N.I.A.M. fields	148,872	64,646
Total	4,746,426	3,971,045

We have every reason to be confident that by continuing to work along rational lines we shall be able to maintain the increased production for a considerable period.

Drilling activities on some of the fields in respect to which contracts were concluded on the basis of Art. 5a of the Indian Mining Art, referred to in our previous report, have met with success.

Efforts were continued everywhere towards increased efficiency, which was attained, i. a., by laying down, on an extensive scale, motor transport roads to and on the oilfields, by means of which the necessary materials and personnel can be transported more rapidly in motor vehicles.

Similar progress was made in the modernization of the repair shops in the production centers.

For the transportation and treatment of the increased crude oil production it was necessary to extend still further the pipeline system, the storage capacity and the plants. Last year more than 400 kilometers of pipeline were laid, bringing the total up to almost 5000 kilometers.

The refining capacity was considerably increased everywhere, and by the application of new inventions the quality of the various products was improved.

The all-around expansion of our industry necessarily resulted in considerable increase in the number of our employees in 1929; on December 31, 1929, there were employed in our installations in the Dutch East Indies 3147 Europeans and 57,434 natives, as against 2645 Europeans and 47,600 natives on December 31, 1928. In addition there were 23,601 natives in the service of our contractors.

Nederlandsch-Indische Aardolie Maatschappij

Production—Djambi:

	1929	1928
	Metric tons	
Badjoebang	88,350	37,568
Betoeng	38,270	26,622
Total	126,620	64,190

Towards the end of the year under review there were six wells in production at Badjoebang, producing in all 577 cubic meters per 24 hours.

Exploitation of the shallow wells at Betoeng was continued. The deep exploration boring reached at the end of the year a depth of 2269 meters.

Exploration drilling on the Meleboeai, Tempino, Menkanding and Kenali Assam fields was likewise continued.

Production—Aroebaai:

1929	1928
22,240 Metric tons	400 Metric tons

Boenjoe

The well sunk in this field was brought in October, 1929, with 180 cubic meters oil per day; it has been temporarily shut in until the means of transportation are ready.

Sarawak

Crude oil production of Sarawak has again increased. In 1929 it amounted to 760,166 metric tons, as against 751,092 metric tons in 1928.

Egypt

The 1929 production in Egypt was 271,520 metric tons (1928—268,461 tons).

Rumania

Total net production of the entire Rumanian oil industry in 1929 reached a new record, viz., 4,827,278 metric tons, an increase of about 13 per cent. The number of meters drilled in 1929 was 307,936.

This increase in production is to be ascribed partly to the opening up of new layers in existing wells, but it is also the direct consequence of the more intensive drilling activity throughout the year, the total depth drilled having exceeded that in 1928 by 25 per cent.

This continually increasing activity in Rumania is a phenomenon which may lead in the future to consequences detrimental to the industry. Up to the present nothing has been done in Rumania to follow the example of other countries where producers have made many efforts to cooperate in matters of drilling and production in order to avoid unnecessary expense in drilling an excessive number of wells and in this way to preserve the country's oil reserves.

Neither have any steps been taken in Rumania to dispose in the most rational and economical manner of the surplus of oil products available for export. Many Rumanian producers continue to expend money and embark upon the establishment of new distributing organizations outside Rumania for the export of their products, instead of availing themselves of the organizations already existing in sufficient numbers and thereby saving their resources and energy for further developments inside the country.

Rumania did not escape the effects of the widespread financial difficulties which prevailed generally in 1929; the petroleum industry there continued to suffer under the exceptionally heavy fiscal burdens.

On the other hand the amendment of the Mining Act, to which reference was made in our previous report, contributed appreciably to establishing greater faith in the Rumanian petroleum industry, which—at least if no obstacles are placed in the way—may lead to a return to more satisfactory conditions for the industry itself and consequently for the country as a whole.

The Astra Romana, with a production of 852,372 metric tons in 1929 against 705,854 metric tons in 1928, maintained its leading position in the Rumanian industry and took the first place not only in regard to the quantity of crude oil produced and the exploration and discovery of new fields and sources of production, but also in the application of the most modern methods and plants in all branches of the petroleum industry. This policy of modernization and rationalization, which has been followed for a number of years, accompanied by the avoidance of expenditure on distributing installations outside Rumania, which was rendered possible by cooperation with the selling organizations of the group, has proved to be the right one, as is evidenced by the fact that in 1929 the Astra Romana again earned sufficient profits to pay a dividend.

Russia

Attention should be drawn to the enormous funds invested in commercial facilities belonging to us which have been confiscated in Russia without any compensation being made (Bnito, Mazout and Standard Russe).

Apart from large offices in Petrograd, Moscow, Baku, Grozny and elsewhere, our trading assets—the exact figures cannot be given owing to the files in Russia also having been confiscated—were about as follow:

1. Steamships, lighters, etc., on Russian waters: 12 tankers with a capacity of 14,000 tons; 44 steam tugs; 81 steel lighters; 116 wooden lighters; 1 dry dock.

2. Tank installations throughout the country (not counting storage facilities at the refineries): 244 depots with a storage capacity of about 640,000 tons.

3. Refineries (Baku, Grozny and Novorossisk): 1 with a daily capacity of 3100 tons (Baku) and 936,000 tons storage capacity; 2 with a total daily capacity of 3000 tons (Grozny and Novorossisk); and 318,000 tons storage capacity.

4. Further, we had large interests in the following companies amongst others: Grozny Sundja, S. M. Schibajeff & Co., North Caucasian, Ural Caspian, participants (Sooutchastniki).

This is all apart from the confiscation of about £2,150,000 in cash, of which £1,123,000 belongs to the Mazout, Bnito and Standard Russe, the remainder belonging to our other Russian companies. Furthermore, there were confiscated about

1,000,000 tons of products which at the time of confiscation represented a value of £8,000,000 and which have, of course, been disposed of long ago by the Soviet Government for export.

The Soviet Government repeatedly endeavors to show that:

(a) The workmen are better paid by them than they were by us, but on one occasion they had to admit that the reverse was the case (vide article by Lomoff in Izvestia, January 28, 1926).

(b) The industry is much better managed by them, but they have, nevertheless, had to call in the aid of the S.O.C. of New York to set up an installation at Batum for improving the quality of their export kerosene.

The production in Russia in 1916 was: 9,862,000 tons. The production in Russia in 1929 was: 14,256,584 tons.

In the same period we have raised the production in the Dutch East Indies from 1,678,859 tons in 1916 to 4,746,426 tons in 1929, whilst the Rumanian producers have increased their production from 1,885,619 tons in 1913 (therefore before the war) to 4,827,278 tons in 1929 (in 1916 the production was 898,994 tons).

Considering what has been done in other countries the results obtained by the Soviet Government with their rich fields are very poor indeed.

We have every reason to believe that notwithstanding the confiscation of hundreds of millions the financial results of this state industry compare very unfavorably with those of our private enterprise.

The export of petroleum products from Russia on the present scale can still only be made possible by withholding from the Russian consumers what they themselves so urgently need.

United States of America

Figures for the gross crude oil production of the companies belonging to our group were:

	1929	1928
	Metric tons	
Shell Petroleum Corp.	3,602,835	3,890,767
Shell Oil Company	3,980,717	3,812,233
	7,583,552	7,703,000

By restricting production on their fields these companies continued to cooperate in the endeavor to check the overproduction in the United States.

In the meantime the exploration activities of the Shell Petroleum Corporation and the Shell Oil Company have led to the acquisition of new and valuable crude oil reserves.

After prolonged, laborious and able negotiations on the part of the Government the Netherlands have finally been recognised by the United States, with regard to its mining legislation, as a reciprocating country in the sense of the American Land Leasing Act.

The pipeline connection from the West Texas fields to the new refinery at Houston was completed in 1929 and, together with the refinery, brought into operation at full capacity.

At Martinez an installation was brought into operation for the manufacture of asphalt emulsion, whilst a beginning was made with the building of a plant for manufacturing asphalt, which plant reached completion at the time of compiling this report and was put into operation immediately.

Through the Shell Eastern Petroleum Products Inc., taking over various distributing organisations in the New England States, the marketing possibilities for motor spirit and other products were better assured, whilst also the activities of the Shell Petroleum Corporation and of the Shell Oil Company were successful in this direction.

Partly in order to provide the necessary funds for this additional capital expenditure, in June, 1929, the Shell Union Oil Corporation issued $40,000,000 5½% cumulative, convertible, preference shares, and in the following September $50,000,000 5% Sinking Fund Gold Debentures maturing in 20 years and bearing a stock purchase warrant.

During 1929 prices in California were subject to little fluctuation. In the Mid-Continent crude oil prices were on the average on a higher level, whilst the products, especially in the busy season, were quoted lower than in 1928, which facts did not fail to affect the financial results of our business there.

Mexico

Taxes burdening the petroleum industry are still too heavy and would have to be considerably lightened to enable Mexico to compete successfully with other producing countries on the world market.

La Corona

Production of La Corona during the past year amounted to 363,361 metric tons, against 528,979 tons in 1928.

An arrangement was made with the Aguila whereby that company took over the shares of the "Cia. Mex. Holl. La Corona, S. A." in exchange for two million ordinary shares in the Aguila; this will lead to an appreciable saving in the total working expenses.

El Aguila (Mexican Eagle)

Total production during 1929 was 1,689,564 tons, against 893,681 tons in 1928. The Tonalá field (S. E. Mexico) came up to expectation and produced in the past year 827,078 tons.

Modernisation of the refinery at Minatitlan, the capacity of which has been increased to 20,000 barrels per day, was continued.

Dredging operations in the Coatzacoalcos River were completed and the Minatitlan refinery can now be reached by ships of greater draught.

The well which was brought in at Mecatepec in February, 1928, is still producing water-free oil. Many difficulties have been encountered in the exploration of this field and the result of further drilling is now awaited.

The exploration of other fields is being energetically pursued.

Canadian Eagle

There were regular deliveries of crude oil purchased from Venezuela, totalling 6,695,000 barrels, which were treated in the refinery of Aruba.

Curaçao

Considerable additions were made to the tank parks, where an increasing need was felt for more storage capacity for products as well as for crude oil. The total storage capacity is now 1,840,600 metric tons.

Balance Sheet as of December 31, 1929

Royal Dutch Company

Assets		Liabilities	
Unissued shares	f. 466,376,000.00	Share capital	f. 970,000,000.00
Shares in the Bataafsche Petroleum Mij., nominal f. 180,000,000 Shares in the Anglo-Saxon Petroleum Co., Ltd., nominal £14,100,000 Shares in the Asiatic Petroleum Co., Ltd. nominal £ 2,100,000 and participation in various other companies	f. 312,186,542.89	Preference share capital	1,500,000.00
		Priority shares	28,500,000.00
		Unclaimed dividends	2,249,542.00
		Unclaimed dividends on priority shares	81,463.50
		Creditors	3,700.00
		Undistributed dividend	1,015,025.32
		Reserve as per article 4 of the Articles of Association	80,083,431.35
Cash in hand and at bankers	82,512,355.43	Profit and Loss account	126,471,391.43
Debtors	348,188,405.28		
Interim dividend priority shares	641,250.00		
	f. 1,209,904,553.60		f. 1,209,904,553.60

The benzine installation at Bullenbaai has also been enlarged.

In view of the housing accommodation for the personnel at Negropont becoming inadequate, an extensive building programme has been taken in hand for the erection of a block of houses on the Groot Piscadera estate situated to the N.W. of Emmastad.

In the past year also the fleet was increased to 32 ships, and in order to meet the need for further docking facilities a second dry-dock of 4000 tons capacity was taken into use under the name of the Juliana Dock.

Venezuela

An event of importance in the past year was the arrangement made in November between the principal producing companies in Venezuela which has made it possible to adopt a more rational method of production.

Caribbean Petroleum Company

Production

1929	1928
2,330,341 Metric tons	2,040,759 Metric tons

The exploration well drilled to test the light oil layer was brought in at the end of the year with the very considerable initial production of about 1500 tons per day, whereby the favourable expectations as to the production from this layer have materialised.

The necessary additions and improvements have been made all round.

Venezuelan Oil Concessions, Ltd.

Production

1929	1928
6,469,206 Metric tons	5,084,580 Metric tons

Where necessary the pumping stations have been enlarged and improved, and the most modern appliances have been introduced to obtain the most efficient and economical operation.

Work has been begun on the drainage of the extensive swamps in the Lagunillas field.

Colon Oil Corporation

The pipeline from the Colon District to the Lake of Maracaibo referred to in the previous report was almost completed in 1929, as well as the building of a loading jetty on the lake shore.

The pumping and shipping of the oil production was begun early in 1930.

Trinidad

Figures for the Trinidad production were:

1929	1928
102,800 Metric tons	65,187 Metric tons

By more intensive drilling and the opening up of new oil-bearing layers better production has been obtained.

Operation of the Edeleanu plant erected at Point Fortin for improving the quality of kerosene was started and is fully justifying the hopes entertained of it.

Argentina

Crude oil production in 1929 was only 15,079 tons as against 50,773 tons in 1928; the potential production today is estimated at over 350,000 tons per annum, and the low production over the year was due to our being obliged to suspend all operations and to close in practically all the wells in consequence of the permit granted early in the year for building a refinery at Buenos Aires being withdrawn shortly after it was signed (vide World Petroleum, May, p. 186.)

The necessary permit to resume construction has been received and it is therefore hoped that we shall now be able to proceed with normal development of our Argentine business in which the group has invested a very considerable amount of money.

At the present time the Argentine is largely dependent upon imported petroleum products as the national production is still insufficient for the country's steadily growing internal consumption, and an unhampered development of its own resources will be of undoubted benefit in assisting to improve the balance of trade.

Provident Fund

On December 31, 1929, there were about 33,000 members of this Fund. The members' contributions for 1929 amounted to about *f*13,000,000.—and those of the companies to about *f*31,000,000.—.

After addition of interest and deduction of amounts refunded, the credit balance in the Fund at the end of the year amounted in round figures to *f*284,000,000.—, which amount, as is known, is invested and administered separately.

Hydrogenation Process Accepted by Royal Dutch

ENTRY of the Royal Dutch-Shell group into the European development of the hydrogenation industry sponsored by the Standard-I. G. interests is notable. It marks the first enlistment of an independent oil company in this new extension of the refining business. It emphasizes the commercial opening of the hydrogenation process to the petroleum industry throughout the world. It is the most significant endorsement that could be given to the business importance of the chemical manufacture of oil products.

Royal Dutch-Shell has acquired a participation in the hydrogenation patents of the Standard-I. G. outside the United States, but has no contract interest in the U. S. patent rights. Like Imperial Chemical Industries, Ltd.—the powerful chemical combine of Great Britain—Royal Dutch-Shell has entered into an arrangement with Standard-I. G. for independent commercial exploitation of the hydrogenation process, in conjunction with mutual technical development. Moreover, provision has been made for the complete exchange, between all users of the process in every country, of full technical information and of the rights to use improvements introduced by any partner or licensee.

Special circumstances governed the entry of both the above mentioned European companies as junior regional partners of the Standard-I. G. The negotiations leading thereto were carried on by the foreign interests of the Standard Oil Company (New Jersey) and were entirely unconnected with American considerations. Royal Dutch-Shell subsidiaries in the United States stand on the same basis as all other American companies, i.e., they can acquire a U. S. license by purchase of a stock interest in the Hydro Patents Company (vide World Petroleum, April, p. 127). Equally, licenses in countries outside the United States will also be granted on a parallel basis to companies other than Royal Dutch-Shell and Imperial Chemical Industries, Ltd.

While the British chemical combine will probably use coal as its raw material—its development work having been exclusively in that direction—the Royal Dutch-Shell's operations are likely to be confined to oil as a raw material. A logical step of the British government would be to foster the hydrogenation process in Great Britain by rebate of the excise tax on gasoline and/or by the imposition of a protective duty on that commodity. From the point of view of her national interests Great Britain needs at least a nucleus of domestic production of oil products to serve her essential requirements in national emergencies when shipments from overseas might be hindered.

International Trade in Gasoline

World's 100 Million Barrel Gasoline Commerce Completely Pictured for the First Time, Based on Research in the 1928 Statistics

By Chester Lloyd Jones
Dean, School of Commerce
University of Wisconsin

THIS valuable compilation of the world gasoline trade presents a comprehensive picture of the extent to which gasoline has become a commodity of international commerce. Parts of this picture are known to a few students. The whole picture has hitherto baffled efforts at portrayal. Accurate tabulation of the world gasoline trade is not possible. Official returns of many countries are incomplete, and those given by exporting and importing countries show in some cases wide discrepancies in a particular trade. Elaborate notes are appended to the tabulation to explain the manner in which the various entries were selected. Since the close of the year under review there have been changes in the world trade, but the year 1928 is the latest that can be analyzed with approach to accuracy.

AMONG gasoline export countries the outstanding contributor is the United States. It shipped 51,752,000 barrels in 1928. This amount was about one-seventh of the local production (vide Commerce Yearbook, 1929, Vol. 1, p. 311). Between 1921 and 1928 these American exports increased fourfold in quantity and in the latter year were greater than those of all other countries combined.

Next after the chief supplier in current years comes a group, each shipping fairly comparable quantities of roughly 5,000,000 to 6,000,000 barrels. These included in 1928 the Netherlands West Indies (6,413,000 barrels), Russia (5,638,000), Rumania reporting similar exports and the Netherlands East Indies (5,147,000 barrels). Persia was next with 3,150,000 barrels, followed by Peru (2,627,000 barrels) and Mexico (2,158,903 barrels).

Absence of some of the ranking producers of crude from the list of leading exporters is notable. Venezuela, second producer of crude, and Colombia both export negligible amounts of gasoline to other lands.

Countries sharing in the export trade in gasoline are, as seen above, comparatively few in number and are closely identified with large crude petroleum producing areas—as is to be expected due to the tendency of manufacture, other things being equal, to locate near sources of raw materials.

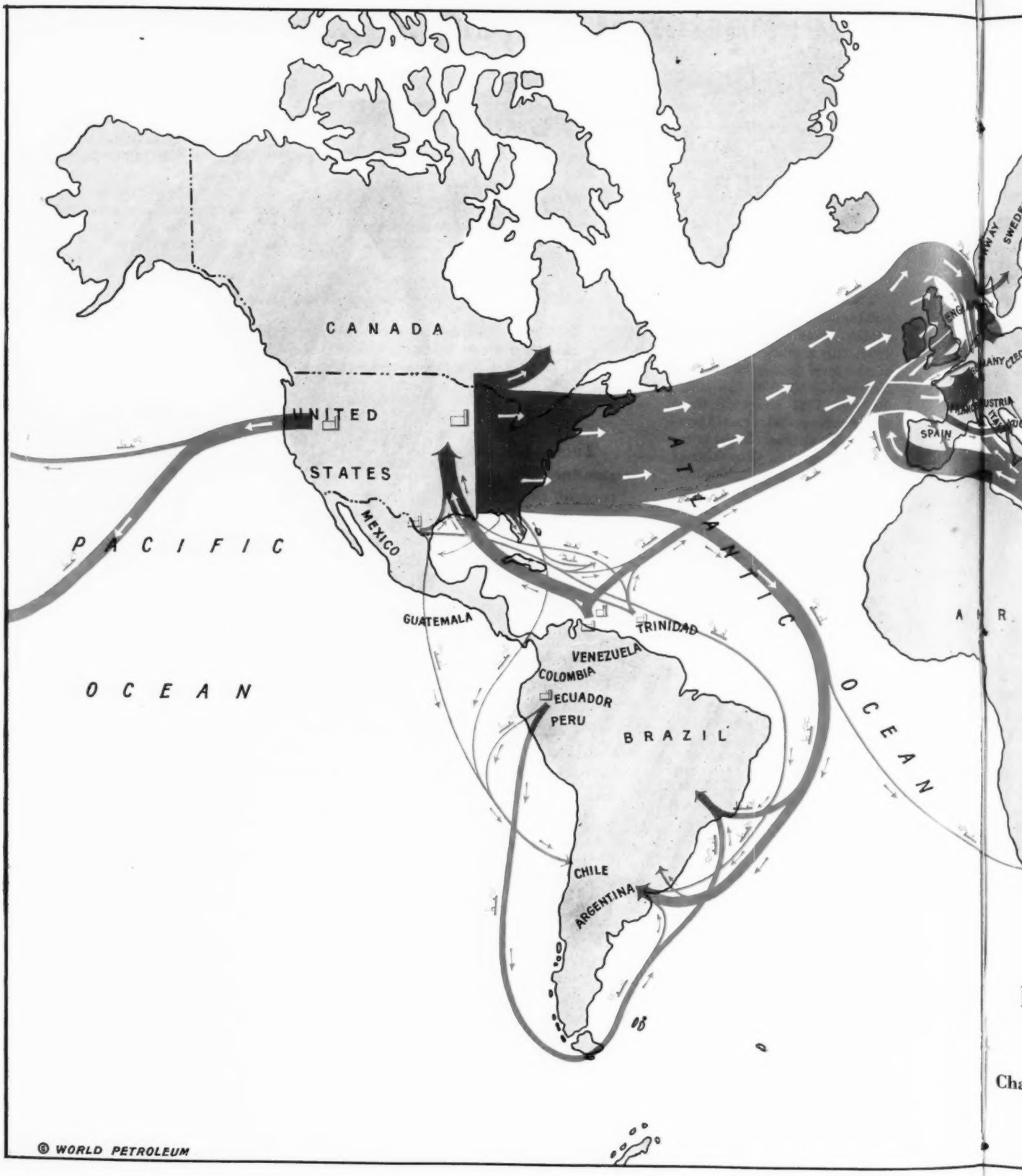
Export markets for gasoline, as for other manufactured products ready for consumption, tend to scatter all over the world, and tend to be greatest in the industrial areas. The great use of gasoline in the motor industry modifies somewhat the accuracy of the generalization, due to the fact that some regions, though but comparatively sparsely settled, have developed extensive road systems over which a larger proportion of their traffic is carried longer distances by motor vehicles than would otherwise be the case. Examples of such development are South Africa, New Zealand and Australia which, with a combined population of less than 14,000,000 people, import more than industrialized Germany with a population of 62,000,000 people.

Indigenous petroleum resources and refineries on the other hand also influence the imports of gasoline, causing the United States, which has half again as many roads as all Europe and a well-developed industrial background, to figure only about one-fifth as important as the United Kingdom as a buyer of imported gasoline.

Far the most important factor in the import of gasoline is the market in Europe. The total purchases reached in 1928 between 55 and 60 million barrels or over 50 per cent of the total entering international trade. To a high degree this trade centers in the countries surrounding the North Sea, which take over four-fifths. Of the total imports the United Kingdom took 37 per cent in spite of the large refineries within the country depending on imported crude oil. France took 17 per cent of the total—almost half as much as the British purchase. Germany took 12 per cent, the three Scandinavian countries 8 per cent, the Netherlands 6 per cent and Belgium 3 per cent. The two more important Latin countries of Southern Europe, Italy and Spain took respectively 5 per cent and 3 per cent of European imports.

Europe is not only the greatest import market for gasoline in the world and the one in which the trade has shown the greatest tendency toward expansion, but it is the only one in which competition is worldwide. To its demands in 1928 the United States contributed 59 per cent of the total imports, somewhat less than half the shipments going to Great Britain, with France, Germany and the Netherlands next in order. Among other American suppliers to Europe the Netherlands West Indies, marketing gasoline from Venezuelan oil, was the most important. Countries of Eastern Europe supplied 15 per cent of the European demands (Russia 9 per cent and Rumania 6 per cent). Shipments from the United Kingdom—chiefly to Scandinavian countries—were 4 per cent. From Asia were received 13 per cent of European total imports, chiefly shipments from Persia to France, the United Kingdom, Germany and Italy.

Geographical influences and communications services have to a high degree brought about a zoning of the import gasoline market. New World purchases of gasoline are almost exclusively made from New World suppliers. Within this zone, too, the continent of North America, except for purchases from the nearby Caribbean coast of Northern South America, is practically a closed market.


CANADA
UNITED
STATES
MEXICO
GUATEMALA
TRINIDAD
VENEZUELA
COLOMBIA
ECUADOR
PERU
BRAZIL
CHILE
ARGENTINA
SPAIN
PACIFIC
OCEAN
ATLANTIC
OCEAN
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Flow of Gasoline in World Commerce

VOLUME OF TRADE PROPORTIONAL TO WIDTH OF RED STREAMS

Scale is not the same as used on Chart of Crude Oil Trade, World Petroleum, April, pp. 130 & 131

Charted from Digest Made for World Petroleum by Chester Lloyd Jones

Based on Statistics for 1928—Figures for 1929 not available until 1931

Drawn by International Map Co. Inc. N.Y.

World Trade in Gasoline Analyzed. Exports and Imports by Countries

Year 1928 — **Figures Indicate Thousands of U. S. Barrels (42 U. S. Gallons)** — **Year 1928**

Exports From

Imports Into	Statistical Total Imports	ASIA: Netherlands East Indies 1926	ASIA: Sarawak (British Borneo) 1927	ASIA: British Malaya	ASIA: Persia	ASIA: Iraq	ASIA: British India (Burmah)	AFRICA: Egypt	EUROPE: Russia 1927	EUROPE: Rumania	EUROPE: Poland	EUROPE: United Kingdom	EUROPE: Belgium and Luxemburg	EUROPE: Netherlands	EUROPE: Germany	EUROPE: Italy	EUROPE: France	EUROPE: Denmark	AMERICA: United States	AMERICA: Netherlands West Indies	AMERICA: Peru	AMERICA: Mexico	AMERICA: Venezuela	AMERICA: Trinidad and Tobago	AMERICA: Canada	Other Countries	Import Totals
Statistical Total Exports		5,149	1,028	1,593	3,150[36]	[37]	...	342	5,638	5,638[37]	525	1,987	[18]	[21]	41[28]	...	...	...	51,752	6,413	2,627	2,156	200	1,124	113	.....	.....
NORTH AMERICA																											
Canada	4,025	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,409[1]	64[1]	.....	.....	.....	.....	.....	1	4,474
Mexico	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	295[1]	.....	.....	.....	.....	.....	.....	.....	295
Newfoundland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7[1]	.....	.....	.....	.....	.....	64[1]	.....	71
United States	4,198	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89[2]	.....	.....	.....	.....	.....	.....	.....	2,462[2]	52[2]	760[2]	149[2]	661[2]	25[2]	.....	4,198
CENTRAL AMERICA																											
Brit. Honduras	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9[1]	.....	.....	15[2]	.....	.....	.....	.....	24
Costa Rica	35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14[1]	.....	18[2]	.....	.....	.....	.....	.....	32
Guatemala	65	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9[1]	.....	21[2]	32[2]	.....	.....	.....	.....	62
Honduras	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	94[1]	.....	.....	.....	.....	.....	.....	.....	94
Nicaragua	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13[1]	.....	13[1]	.....	.....	.....	.....	.....	26
Panama	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	180[15]	1	1[2]	.....	.....	.....	.....	.....	182
Salvador	56	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9[1]	.....	44[2]	.....	.....	.....	.....	.....	53
WEST INDIES																											
Bermuda	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3[1]	.....	.....	.....	.....	.....	.....	.....	3
British West Indies	152	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	42	1	.....	.....	.....	100	3	.....	146
Cuba	1,181	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	896[38]	83[1]	.....	119[2]	.....	.....	.....	10	1,138
Dominican Repub.	113	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87[1]	25[1]	.....	.....	.....	3[1]	.....	.....	115
Haiti	39[5]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32[1]	6[1]	.....	.....	.....	.....	.....	.....	38
Martinique	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8[1]	.....	.....	.....	.....	5[2]	2[1]	.....	15
Neth. West Indies	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	249[17]	.....	.....	.....	3[2]	.....	.....	1	253
Porto Rico	260	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	311[13]	26[1]	52[2]	149[2]	31	42[2]	.....	.....	580
SOUTH AMERICA																											
Argentina	2,332	.....	.....	.....	.....	.....	.....	.....	3[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,783[1]	.....	662[2]	189[2]	.....	.....	.....	.....	2,637
Bolivia	43[33]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11[33]	.....	27[1]	.....	.....	.....	.....	.....	38
Brazil	2,162	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,254[1]	.....	571[2]	481[2]	.....	.....	.....	13	2,319
British Guiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1[1]	.....	.....	.....	.....	15[1]	7[1]	.....	23
Chile	436	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1[2]	.....	.....	.....	234[32]	.....	267[1]	103[2]	.....	.....	.....	.....	610
Colombia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9[1]	15[1]	68[1]	.....	4[1]	.....	.....	.....	96
Ecuador	14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14[2]	.....	.....	.....	.....	.....	14
Paraguay	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1[1]	.....	.....	.....	.....	.....	.....	.....	1
Peru	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1[1]	.....	.....	.....	.....	.....	.....	.....	1
Uruguay	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	406[1]	.....	.....	.....	.....	.....	.....	.....	406
Venezuela	22[23]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12[1]	.....	.....	.....	.....	3[1]	.....	.....	15
EUROPE																											
Austria	742	.....	.....	.....	2[2]	.....	.....	.....	59[2]	622[2]	29[2]	.....	.....	.....	4[2]	17[2]	.....	.....	4[1]	.....	.....	.....	.....	.....	.....	6	745
Belgium	1,443	.....	.....	.....	118[2]	.....	.....	.....	142[2]	32[1]	.....	121[2]	.....	238[2]	.....	.....	.....	.....	1,274[10]	64[1]	.....	.....	.....	.....	.....	47	2,036
Bulgaria	57	.....	.....	.....	.....	.....	.....	.....	.....	56[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	56
Cyprus	.....	.....	.....	.....	.....	.....	.....	9[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9
Czechoslovakia	929	.....	.....	.....	.....	.....	.....	.....	35[2]	107[2]	375[2]	.....	.....	.....	3[2]	.....	.....	.....	6[2]	.....	.....	.....	.....	.....	.....	403	929
Danzig[22]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63
Denmark	1,439	.....	.....	.....	.....	.....	.....	.....	.....	.....	18[2]	628[34]	.....	.....	45[2]	.....	.....	.....	976[1]	.....	.....	.....	.....	.....	.....	32	1,699
Estonia	43	.....	.....	.....	.....	.....	.....	.....	12[2]	.....	5[2]	4[2]	.....	.....	7[2]	.....	.....	.....	9[1]	.....	.....	.....	.....	.....	.....	3	40
Finland	586	.....	.....	.....	.....	.....	.....	.....	33[2]	.....	4[10]	20[2]	.....	120[2]	70[2]	.....	.....	1[2]	386[1]	.....	.....	.....	.....	.....	.....	3	637
France	9,887[7]	.....	.....	.....	2,136[2]	.....	.....	206[2]	1,174[2]	242[2]	8[2]	12[2]	88[2]	6[2]	3[2]	.....	.....	.....	5,894[19]	209[1]	.....	58[2]	60[2]	.....	.....	1	10,097
Germany	7,078	167[2]	.....	.....	929[2]	.....	82[2]	.....	1,025[2]	1,028[2]	2[2]	5[2]	14[2]	7[2]	.....	.....	.....	.....	3,264[19]	.....	35[24]	82[2]	423[16]	.....	.....	11	7,079
Greece	302	.....	.....	.....	.....	.....	.....	.....	.....	267[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34	301
Hungary	239	.....	.....	.....	.....	.....	.....	.....	.....	237[2]	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	239
Irish Free State	719[3]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	345[2]	.....	.....	.....	.....	.....	.....	171[1]	.....	.....	.....	.....	.....	.....	293	809
Italy	2,742	.....	.....	.....	823[2]	.....	.....	.....	422[2]	151[2]	.....	162[1]	.....	.....	4[1]	.....	.....	.....	1,465[1]	.....	.....	.....	.....	.....	.....	65	3,092
Latvia	69	.....	.....	.....	.....	.....	.....	.....	41[2]	.....	.....	1[2]	.....	.....	6[2]	.....	.....	.....	10[1]	.....	.....	.....	.....	.....	.....	.....	58
Lithuania	32	.....	.....	.....	.....	.....	.....	.....	5[2]	.....	.....	1[2]	.....	.....	5[2]	.....	.....	.....	18[2]	.....	.....	.....	.....	.....	.....	3	32
Malta	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands	1,695	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	165[1]	194[2]	.....	.....	.....	.....	.....	2,885[1]	419[2]	195[1]	.....	.....	.....	.....	7	3,865
Norway	522	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	174[1]	.....	.....	3[2]	.....	.....	.....	287[1]	.....	.....	.....	.....	.....	.....	1	465
Poland[22]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portugal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	239[1]	.....	.....	.....	.....	.....	.....	.....	239
Spain	1,928	.....	.....	.....	.....	.....	.....	4[2]	969[2]	39[13]	.....	39[2]	.....	.....	.....	.....	.....	.....	967[1]	.....	.....	43[2]	.....	.....	.....	1	2,062
Sweden	1,963	.....	.....	.....	.....	.....	.....	.....	38[2]	.....	2[2]	798[2]	4[2]	.....	81[2]	.....	.....	136[2]	1,562[1]	.....	.....	.....	.....	.....	.....	.....	2,613
Switzerland	1,006	.....	.....	.....	.....	296[37]	.....	1[2]	13[2]	58[2]	2[2]	.....	11[2]	.....	2[2]	...	2[2]	.....	610[2]	.....	.....	1[2]	11[2]	.....	.....	.....	1,007
Turkey	217	.....	.....	.....	.....	.....	.....	.....	104[2]	112[1]	.....	.....	.....	.....	.....	3[2]	.....	.....	2[2]	.....	.....	.....	.....	.....	.....	.....	221
United Kingdom	20,885	851[2]	28[2]	.....	1,795[36]	.....	.....	123[2]	1,316[2]	580[2]	.....	.....	.....	.....	.....	.....	.....	.....	15,636[1]	1,582[23]	76[2]	208[2]	.....	209[2]	.....	103	22,507
Yugoslavia	64	.....	.....	.....	.....	.....	.....	.....	.....	58[2]	.....	1[2]	.....	.....	.....	4[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	64
ASIA																											
Borneo—British	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ceylon	239	239[2]	.....	37[25]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	276
China	479	159[2]	.....	.....	.....	.....	.....	.....	12[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	169[9]	.....	.....	.....	.....	.....	.....	102[7]	442
Chosen (Korea)	76	5[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	28[2]	.....	.....	.....	.....	.....	.....	43[12]	76
Hong Kong	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30[1]	.....	.....	.....	.....	.....	.....	.....	30
India—British	3[4]	.....	.....	.....	7[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15[1]	.....	.....	.....	.....	.....	.....	.....	.....	22
Indo-China—French	.....	.....	.....	77[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15[1]	.....	.....	.....	.....	.....	.....	.....	92
Japan	248	228[2]	.....	56[26]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	783[20]	.....	.....	.....	.....	.....	.....	.....	1,067
Malaya—British	2,515	1,791[2]	719[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5[2]	.....	.....	.....	.....	.....	.....	.....	2,515
Palestine	.....	.....	.....	.....	.....	.....	.....	45[1]	.....	2[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	47
Philippine Islands	546	177[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	377[1]	.....	.....	.....	.....	.....	.....	.....	554
Siam	.....	.....	.....	49[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13[1]	.....	.....	.....	.....	.....	.....	.....	62
Syria	168	.....	.....	.....	34[2]	.....	.....	2[2]	.....	128[2]	.....	.....	.....	.....	.....	.....	.....	.....	3[2]	.....	.....	.....	.....	.....	.....	2	169
AUSTRALASIA																											
Australia	5,082[35]	1,887[35]	67[35]	709[1]	68[35]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,752[1]	.....	.....	.....	.....	.....	.....	.....	5,483
British Oceania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	46[1]	.....	.....	.....	.....	.....	.....	.....	46
New Zealand	1,558	246[2]	.....	49[25]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,220[1]	.....	.....	.....	.....	.....	.....	.....	1,515
AFRICA																											
Algeria	.....	.....	.....	.....	.....	.....	.....	.....	.....	29[1]	.....	.....	.....	.....	.....	.....	.....	.....	474[14]	.....	.....	.....	.....	.....	.....	.....	503
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	57[1]	.....	.....	.....	.....	.....	.....	.....	57
Congo—Belgian	94	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
East Africa—British	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51[1]	.....	.....	.....	.....	.....	.....	.....	51
Egypt	544	.....	.....	.....	.....	[6]	.....	.....	.....	181[2]	.....	.....	.....	.....	.....	.....	.....	.....	7[1]	.....	.....	.....	.....	.....	.....	356[6]	544
French Morocco	353	.....	.....	.....	.....	.....	.....	74[2]	.....	.....	.....	12[2]	.....	.....	.....	.....	12[2]	.....	134[1]	.....	.....	.....	.....	.....	.....	63	295
Gold Coast	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Madagascar	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18[1]	.....	.....	.....	.....	.....	.....	.....	18
Mozambique	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70[1]	.....	.....	.....	.....	.....	.....	.....	70
Libya	41	.....	.....	.....	5[2]	.....	.....	.....	10[2]	.....	.....	.....	.....	.....	.....	9[2]	.....	.....	17[2]	.....	.....	.....	.....	.....	.....	.....	41
Nigeria	118	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Southern Rhodesia	80	27[2]	.....	.....	.....	.....	.....	.....	1[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	52[2]	.....	.....	.....	.....	.....	.....	.....	80
South West Africa	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	31[2]	.....	.....	.....	.....	.....	.....	19	50
Tunisia	182	.....	.....	.....	68[2]	.....	.....	.....	8[2]	14[2]	.....	.....	.....	.....	.....	.....	.....	.....	91[14]	.....	.....	.....	.....	.....	.....	.....	181
Union of South Africa	1,403	502[2]	.....	150[26]	.....	.....	.....	.....	59[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	842[2]	.....	.....	.....	.....	.....	.....	.....	1,553
OTHER COUNTRIES	.....	.....	.....	466[9]	21	.....	.....	.....	.....	23	38	122	.....	.....	.....	.....	.....	.....	555	.....	18	.....	.....	2	9	.....	1,254
Export Totals		6,279	814	1,593	6,006	296	82	464	5,473	3,966[37]	548	2,699	311	371	234[28]	35	14	137	53,899	4,957	2,134	2,275	655	1,040	110	1,624	96,016

Of total imports into North America of 8,684,000 barrels, Canada purchased 4,025,000 barrels—practically all from the United States—, and the United States purchased 4,198,000 barrels—over half of which came from the Netherlands West Indies. The rest of United States purchases were chiefly from Mexico and Trinidad. North American purchases from non-American areas were only about 1 per cent.

The West Indies constitute a second zone, importing 2,300,000 barrels, supplied in all but minor degree from North America—chiefly from the United States. Mexican shipments reach some importance in Cuba and Porto Rico. Lesser shipments are made by Trinidad. Development of refineries and shipping facilities in the Netherlands West Indies serving Venezuelan and Colombian fields, and services in those fields themselves, may in the future modify the sources of supply, but imports from those sources to West Indian consuming areas were still negligible in 1928. At present those Caribbean coast areas ship large parts of their crude to the United States for refining. To the same destination go also the chief exports of gasoline from the Netherlands West Indies, while a cross trade of an amount about two-thirds as great takes the reverse route from the United States to the West Indies.

A third distinctly American market is South America, importing in 1928 a total of 6,000,000 barrels, of which 60 per cent were from the United States. The only other important contributors were Peru, with 26 per cent and Mexico with 13 per cent. In both cases the chief purchasers were the A B C group of countries and Uruguay in farther South America. The trade, so far as it passes between the Latin American states, is an interesting development, because it is an exception to the often made statement that they have nothing to sell each other. The development of refining in the north coast region of South America may here, as in the West Indies, at a later day modify the source of supply.

Other trade zones of the world are relatively not so important in the international gasoline commerce. Asiatic trade is largely supplied from Far Eastern sources. British Malaya (Straits Settlements) is the largest importer in the region, but a fair proportion of this trade is seen to find its way into re-exports. To the two areas next in importance, which are Japan and the Philippines, the United States ships more than any other country.

Australia and New Zealand—both active purchasers relative to the size of their populations—are supplied from the United States and from the Eastern refineries. African trade is not great in total, the three more important purchasers being the Union of South Africa, the French North Coast holdings and Egypt. All but the last, in which the imported supplies come from Rumania and the Far East, are predominantly U. S. markets.

A summary comparison of the relative importance of the chief exporting and importing zones in the gasoline trade gives some interesting contrasts. In a total reported trade of some 96,000,000 barrels the zones of supply stand as:—America 65 per cent (of which the United States 53 per cent), Asia 15.5 per cent, Europe 13 per cent. The consuming areas for imported gasoline on a similar basis take rank as follows:—Europe 60 per cent, North American continent 9.5 per cent, Oceania 7.5 per cent, South America 6 per cent, Africa 3 per cent and West Indies 2 per cent.

NOTES TO CHART AND TABLE OF WORLD GASOLINE TRADE, 1928

OFFICIAL figures are often incomplete, and those given by exporting and importing countries show in some cases wide varintions. In choosing between different figures for the same trade preference has been given to those of the country considered more likely to have good statistical services. Where the countries involved seemed in this respect equal the following standards were followed:

1. The figure by the importing country was as a rule preferred.
2. Where, however, the figures reported by one country are uniformly smaller than those reported by the countries with which it trades, the smaller figures are accepted on the assumption that this results from better classification of the products shipped.

Grand total of the column headed Statistical Total Imports is not given because figures were unobtainable for certain minor countries and because in the detailed tabulation a choice has had to be made between figures reported by the exporting and importing countries. The column headed Imports Total is made up of the selected items, reported sometimes by the exporting and sometimes by the importing countries, according to whichever were judged to be more nearly accurate.

Mexican statistics showing destination of gasoline shipments are not available. The total Mexican exports of gasoline in 1928 were 2,158,903 bbl. The figures for destinations of Mexican exports are those reported by various countries as imported from Mexico in 1928. It is to be noted that the total of these items is greater than the exports reported by Mexico.

United States figures are from Foreign Commerce and Navigation of the United States for the calendar year 1928, Bureau of Foreign and Domestic Commerce, Washington, 1929, pp. 101 and 266. All others are from the Monthly Petroleum Statistics (1929), Bureau of Foreign and Domestic Commerce as follows:

No. 1: United Kingdom; No. 2: Canada, France, Germany, Belgium, Netherlands, Japan; No. 3: Costa Rica; No. 4: Czechoslovakia, Yugoslavia, Argentina; No. 5: Italy, New Zealand, Switzerland, Union of South Africa; No. 6: Austria, Brazil, Belgian Congo, Greece, Netherlands, West Indies, Sweden, Rhodesia, South West Africa; No. 7: Azores, Malaya, Estonia, Guatemala, Haiti, Lithuania, Latvia, Philippines; No. 8: Argentina, British Honduras, Bulgaria, Ceylon, China, Egypt, Finland, Morocco, Hungary, Martinique, Nigeria, Peru, Poland, Spain; No. 9: Bahamas, Barbados, Chosen, Ecuador, Jamaica, Panama, Rumania, Salvador, Syria.

Footnotes

1. Exporting country's statistics were relied on.
2. Importing country's statistics were relied on.
3. Irish Free State lists no gasoline. This figure is given for "Motor Spirits."
4. British India lists no gasoline in its exports and only 3000 bbl. in its imports.
5. Imports listed for year ended September 30, 1928. There are listed 8000 bbl. from the United States and 23,000 from Porto Rico.
6. This is the United States' figure. There were listed by China 206,000 bbl. from "United States and Hawaii."
7. From Hongkong 47,000 bbl., and from "Singapore, Straits, etc.," 49,000 bbl.
8. From "Suez (Refinery)" 231,000 bbl.
9. Largely to "British Possessions."
10. Listed as from Danzig.
11. This is the Spanish figure. It includes 8000 bbl. from "British Possessions in Europe." Apparently this means Gibraltar. Rumania lists 9000 bbl. to Gibraltar, of which 8000 are included in this figure.
12. From Japan 11,000 bbl.
13. Commerce Yearbook, 1929, Vol. I, p. 706.
14. Deduced from the following:
    U. S. exports listed to "Algeria and Tunisia" ..... 565,000 bbl.
    Tunisian imports from U. S. ..... 91,000 bbl.
    474,000 bbl.
15. This is the United States' figure. Panama reported only 4000 bbl. The difference may be due to failure to consider the canal zone in Panamanian statistics.
16. This is the German figure and probably represents gasoline from the Netherlands West Indies.
17. The Netherland West Indies report only 2000 bbl. imported from the United States.
18. Belgium, in its imports, lists only 777,000 bbl. from the United States, and in its re-exports lists no gasoline whatsoever. There must be a connection between the two discrepancies (i e. Belgium may consider as purely transit trade some of the gasoline which the United States lists as exports to Belgium).
19. These are the French and German figures, respectively. The United States lists 7,726,000 bbl. to France and 1,318,000 bbl. to Germany. Thus, the total of United States shipments listed to France and Germany (9,044,000 bbl.) is very close to the total of French and German imports listed as from the United States (9,158,000 bbl.). The importing countries probably show the more accurate distribution.
20. This is the United States' figure and includes 45,000 bbl. for Kwangtung. Japan lists a total of only 20,000 bbl. from the United States.
21. The Netherlands lists no gasoline in its re-exports, although other countries list a great deal imported from it.
22. The United States exported 26,000 bbl. to "Poland and Danzig."
23. This is the British figure. Netherland West Indies lists 3,351,000 bbl. This discrepancy has not been accounted for. Netherlands reports 419,000 bbl. imports which the Indies do not show at all; but the Indies report 209,000 bbl. exported to France for which France has no corresponding import item. Both of these latter figures have been accepted.
24. This is the German figure. Peru shows an export to Germany of 582,000 bbl. The discrepancy can not be satisfactorily explained.
25. This is the Malayan figure and is very probably duplication, since all Ceylon imports are listed from the Netherland East Indies. Due to lack of Netherland East Indies statistics, it is impossible to check this surmise. Therefore both figures are included instead of reducing the Dutch East Indian figure to 232,000 bbl.
26. The same applies to this figure as to the Ceylon figure. (See note 25 above.)
27. Rumania's export figures were, in every case, considerably larger than the corresponding import figures. The latter are used. This accounts for the discrepancy between the statistical and tabular totals for Rumania.
28. Germany reports very small exports, but other nations report considerable imports from Germany —probably shipments in transit.
29. Australia lists gasoline in an omnibus class entitled, "Petroleum and shale spirit, including benzine, gasoline, pentane, petrol, and naphtha." The statistics are for the fiscal year to June 30. See Monthly Foreign Petroleum Statistics, No. 6, p. 5.
30. This is the figure for Cuban imports. The United States lists no gasoline exports to Cuba.
31. Venezuela lists 139,000 bbl. to Porto Rico, but Porto Rico lists none whatever from Venezuela.
32. This is the United States figure. Chile lists only 102,000 bbl.
33. Figures were available for the first half of 1928 only. Those data were doubled for these figures.
34. This is the Danish figure. The United Kingdom listed a total export of 313,000 bbl. to Denmark.
35. Year ending June 30, 1928—Australian statistics.
36. Statistics for 1927-28. Persia lists only 84,000 bbl. to the United Kingdom, but lists 1,147,000 bbl. to Egypt. Apparently Egypt and the United Kingdom list this as a direct trade between Persia and the United Kingdom. The export item from Persia to Egypt is accordingly dropped.
37. Iraq lists practically no gasoline in her exports. The Switzerland imports indicated from Iraq are probably attributable to Persia.

Venezuelan View of Production

Closer Knowledge and Experience of Problems of Development and of Production Lead Government Advisers To Suggest Additional Legislation . . By a Caracas Contributor

THE petroleum industry of Venezuela has never been of greater advantage to national income than in recent times, for, besides covering the public budget, it has created reserves of appreciable proportions in the financial history of the country. Petroleum exercises a double influence in this field: on the one hand is the income from the taxes paid by the operating companies and on the other is the enterprise it has brought into the commercial and industrial domains of the country.

This South American country has acquired world prominence as an oil producer. While its traditional export products—coffee and cocoa, for example—had won for it a well founded renown in foreign markets, its harvests of these crops were more noteworthy for quality than for quantity, whereas its petroleum industry comprises a great tonnage, the exploitation of which attracts increased capital to stimulate the economic life of the nation in every way.

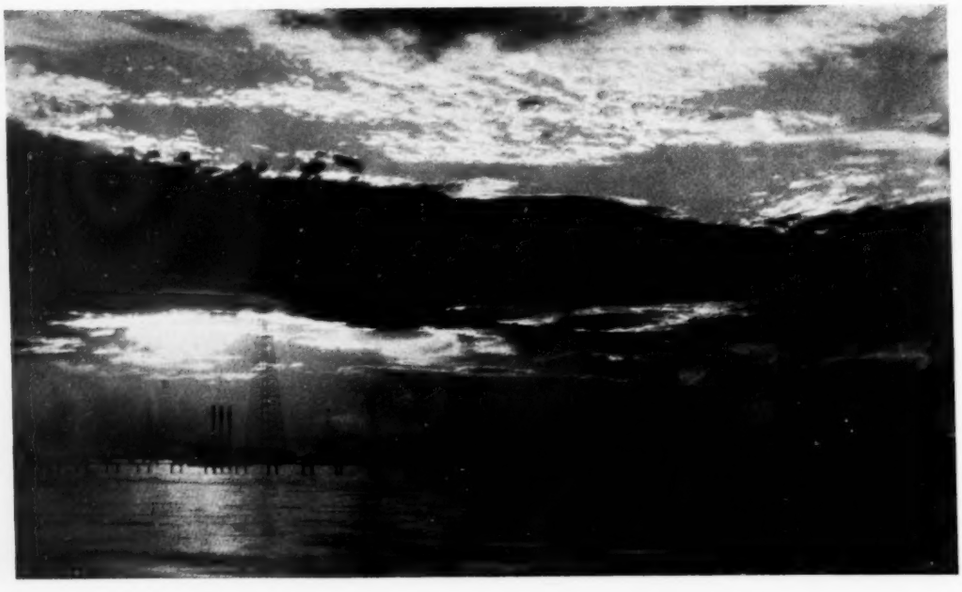
Prior to what might be called the petroleum era, i.e., in the years immediately preceding the World War, public and private wealth in Venezuela was confined to agriculture. The possession of a private automobile was then a real event even in the capital of the republic—Caracas—whereas today the city abounds in all kinds of gasoline vehicles, both for business and for pleasure.

The extensive net of roadways furrowing the national territory has expanded the horizons of automobile traffic, and with distance thus facilitated and reduced the obstacles which yesterday separated different parts of the Republic from each other have disappeared. Moreover, while roads and automobiles have linked the remotest Venezuelan villages with the center of the country, closer contact has also been established with the neighboring Republic of Colombia by special lines which make the run to Bogota.

The automobile has constituted an excellent means of penetration into Venezuela. At the same time it is an exponent of the present private wealth, which is possessed of an enterprising spirit that has created a diversity of industries or enlarged the old ones and that has transformed the aspect of cities—Caracas, for example, where the low, uniform, semi-Colonial architecture has been succeeded by modern construction within the city and in the suburban expansion.

Active Companies

There are fourteen oil producing companies in Venezuela: Caribbean Petroleum Company, Venezuela Gulf Oil Company, Lago Petroleum Corporation, Venezuelan Oil Concessions, Ltd., Colon Development Company, Ltd., The Richmond Petroleum Company of Venezuela, American British Oil Company, Orinoco Oil Company, Standard Oil Company of Venezuela, Central Area Exploitation Company, Ltd., Rio Palmar Oilfields, Ltd., British Controlled Oilfields, Ltd., Bermudez Company, and Tocuyo Oilfields of Venezuela.



Sunrise over the oilfields of Lake Marcaibo

Petroleum in Venezuela

During the year 1929, to which the statistics of this article refer, seven new companies were registered, namely United Venezuela Oil Corporation, Venezuela Speculation, Inc., Caracas Petroleum Corporation, Venezuela Royalties Corporation, Société Française de Récherches au Vénézuéla, Belgian French Venezuela Oil Corporation, and Belgo Venezuelan Oil Corporation. These new enterprises, added to those established before December 31, 1928, increase to 108 the total number of oil companies registered in the country.

Concessions extend over almost the entire surface of the Republic, in the Eastern and Western States of Anzoátegui, Apure, Cojedes, Falcón, Guárico, Lara, Mérida, Miranda, Monagas, Portuguesa, Sucre, Táchira, Trujillo, Yaracuy, Zamora, Zulia and the Federal Territory of Delta-Amacuro.

Petroleum Production

Although the activities of the oil companies have been restricted for reasons unconnected with the productivity of the wells—reasons which in reality are related to the exigencies of the consuming market—production obtained during the year 1929 surpassed that of 1928 and maintained Venezuela in second place among all oil producing countries. The table on next page shows comparative production during the past three years.

According to the report just presented by the Director of the Technical Office of Mines of the Ministry of Fomento, this production, which indicates a growing increase in the quantity of oil produced within the country, gives only an imperfect idea of the abundance of the mineral. Development has been restricted by the transportation and refining facilities of the companies interested in the industry, to which should be added, as has been stated, the reduction of activities in certain fields on account of worldwide overproduction. Thus the Caribbean Petroleum Company has 134 wells under exploitation in the Mene Grande field and 42 shut in, while the Venezuelan Oil Concessions,

Ltd., has 22 wells operating in the La Concepción field, District of Maracaibo, State of Zulia, where it has 42 shut in.

Proposed Legislation

The report referred to also sets forth suggestions as to new and further-sighted laws and regulations, better adapted to circumstances than those at present existing. The suggested changes tend toward oil conservation, improved development, prevention of accidents, and avoidance as far as possible of the damages caused by the latter, either to national interests, to individuals or to the companies themselves and their employees and laborers. Shrinkage in the revenue derived by the Public Treasury from such a productive industry is also held to be an end to be avoided.

Venezuelan petroleum laws are based on general and too ample terms for their purpose, which is the fiscalization of the many delicate operations in obtaining and transforming the combustible minerals on the large scale of production and of commercial movement accomplished by the petroleum industry.

In support of this assertion the Director of the Technical Office of Mines states that on account of the lack of arrangements the National Government cannot at all times be, as it should, familiar with each and every one of the operations which may have been, or are being, carried out. In other countries concessionaires are not allowed to begin to drill a well, swab it, cement it or plug it, nor to install storage tanks or pumps, nor to execute any kind of work without first obtaining in each case a permit from the competent authority, and without an inspector going to witness the execution of the work.

Along the shore of Lake Maracaibo

Venezuelan Petroleum Production

	1927	1928	1929
January	603,611 tons	1,070,990 tons	1,535,927 tons
February	548,530 tons	997,210 tons	1,413,250 tons
March	629,205 tons	1,117,210 tons	1,529,628 tons
April	594,433 tons	1,144,953 tons	1,618,706 tons
May	621,932 tons	1,242,569 tons	1,765,458 tons
June	603,597 tons	1,257,691 tons	1,647,780 tons
July	684,319 tons	1,339,627 tons	1,666,416 tons
August	714,069 tons	1,298,943 tons	1,791,688 tons
September	796,372 tons	1,311,070 tons	1,698,362 tons
October	948,624 tons	1,452,432 tons	1,712,427 tons
November	949,811 tons	1,526,078 tons	1,665,759 tons
December	975,734 tons	1,543,225 tons	1,799,390 tons
	8,769,237 tons	15,319,479 tons	19,844,791 tons

California as Model

"In the North American State of California," the report adds, "in spite of the fact that the owner of the surface, being also the owner of the subsoil, is the one who leases the land, the State Government has introduced strict regulations for the conservation of pools and for their most adequate development, and it watches compliance by means of suitably organized offices and a large staff of agents, inspectors, and delegates whose maintenance is covered by taxes exacted from the producers."

Application of these principles in Venezuela will bring about an improvement in the regulation of the petroleum industry, the first experience with which, in that country, had of necessity to be developed under the indeterminate conditions cited in the report of the Technical Office of Mines. The desire exists to establish laws and regulations based on experience and equity which, while guarding the interests of the nation, will also assure to producers the guarantees and facilities necessary to the development of their enterprises. The rights and duties of both parties must be defined clearly and precisely. Such laws and regulations would be of mutual benefit, since they would avoid probable controversies and contribute to quickest and fullest development.

Apart from these administrative considerations it is also observed that the petroleum companies, which find themselves benefited by the abundance of oil and by the material advantages which the National Government grants them, do not morally respond to the generous hospitality offered them and do not in return use the natives as employees, although the latter by their activity and competence, would be excellent assistants in office, field, and supervisory work. There is no doubt this condition will soon disappear through a change of opinion and practice on the part of the operating companies in Venezuela.

Petroleum Operations

Last year's official data of the organization and activity of some of these oil companies give a picture of the operations connected with this powerful industry.

Caribbean Petroleum Company

This organization has 228 wells developed without having renounced any of them during the year of the report. Its fields are located in the State of Zulia, where it has concentrated on the Mene Grande Field. There in 1929 it spudded in 37 wells, of which 31 produced oil in commercial quantities, three were temporarily suspended and the other three were still being drilled at the end of the year.

On Dec. 31 last it had 134 wells producing in the Mene Grande Field, giving a total daily production of 8119 tons. On the same date, it had 42 other wells temporarily shut in. In 1929 it abandoned only one well. The total number of wells abandoned by it in its different fields up to the end of last year does not exceed 28.

It produced during 1929 a total of 2,382,076 metric tons of oil, of which it exported 1,880,609 tons. To its refinery at

San Lorenzo it delivered 498,873 tons and used in the fields 2,595 tons. It also produced 19,961 tons of natural gasoline.

Its refinery at San Lorenzo operated without interruption during the entire year, and the company sold the following quantities of refined products for consumption within the country:

Gasoline	48,518,213 liters
Kerosene	3,801,547 liters
Gas oil	3,935,232 liters
Turpentine	2,664 liters
Diesel and engine oil	3,078,751 kg.
Fuel oil	65,791,556 kg.

The company maintains installations, offices and agencies for the improved distribution of its products in every important city of the republic.

Venezuela Gulf Oil Company

In 1929, in addition to its old concessions, this company acquired eight others in the States of Falcon, Monagas and Zulia with a total area of 25,535 hectares. During the same year it started drilling 174 wells and completed 159, of which 157 are commercially exploitable. At the end of 1928 there were 19 wells drilling, which were completed last year with this result: commercially exploitable, 13 wells; nonproductive, 6 wells. The total number of wells operating on Dec. 31 last was 247, and the number of wells shut in was 14.

The number of wells abandoned in 1929 was 36; started before 1929 and abandoned by the end of that year, 67; started and abandoned before 1929, 56; total, 159 wells abandoned during the existence of the company.

Oil was refined as follows:

Fuel oil	59,140 metric tons
Gas oil	221 metric tons
Gasoline	1,596 metric tons
Kerosene	41 metric tons
Distillate	3,785 metric tons
Total	64,783 metric tons

All of these products were used in the operations of the company itself.

The production of petroleum amounted to 5,537,630 metric tons, with the following distribution:

Exported	5,454,209 metric tons
Used	78,168 metric tons
Sold	5,254 metric tons

Probable production of the 14 shut-in wells amounts to 1,556 metric tons daily.

Lago Petroleum Corporation

This company owns concessions in the States of Monagas, Sucre, Trujillo, and Zulia, as well as on the bed of Lake Maracaibo.

On Lake Maracaibo during 1929 this company completed the drilling of 93 wells, located in different fields. In all of them except two it discovered commercially exploitable oil. During the same year it began the drilling of five other wells which are in process of production.

The total production of oil was 4,924,383 metric tons, as follows:

Exported	4,815,769 metric tons
Used	8,654 metric tons
Sold	3,002 metric tons
Refined	96,699 metric tons
Delivered to V. O. C.	258 metric tons
	4,924,382 metric tons

Drilling in the Lake

This company's refinery operates at La Salina, in the immediate neighborhood of the town of Cabimas, District of Bolivar, State of Zulia. The total amount of oil refined was 96,699 metric tons which rendered the following products:

Fuel oil	84,795 metric tons
Gasoline	11,193,218 liters
Kerosene	1,385,408 liters
Gas oil	2,886,737 liters
Distillate	616,373 liters

Its exports amounted to 68,554 metric tons of fuel oil, plus 10,057 tons delivered to vessels for their own use. The company itself consumed 3694 metric tons of fuel oil and a part of the refinery products.

The Lago Petroleum Corporation owns a fleet of 22 tankers for the transportation of oil, all of which, with the exception of two, exceed 1000 registered tons.

During the year 1929 it continued its geological reconnaissance in the States of Anzoátegui, Monagas, Cojedes, Portuguesa and Zamora, the two former situated in the eastern part of the Republic and the other three in the west.

Petroleum Laws

Venezuelan petroleum legislation is widely known for its liberal spirit, but it suffers from certain deficiencies. These are indicated in the observations of the Director of the Technical Office of Mines in the Ministry of Fomento, who has pointed out in the 1929 official report different matters that should be covered by law and which thus far have not been taken into account.

From the fiscal point of view, the country grants such advantages to the petroleum companies under the heading of exemptions from customs import duties that the taxes paid by them are usually much less than the amount of the exemption. For example, the Lago Petroleum Company paid to the Venezuelan Treasury in 1929 the following sums:

Exploitation tax	Bs. 7,386,589
Surface tax	446,397
Initial exploitation tax	30,000
Tax on refined products sold	565,090
Total taxes paid	Bs. 8,428,076

The exemptions from customs duties granted to the company during the same year amounted to Bs. 16,642,351.

Probably nowhere else do oil companies enjoy advantages equal to, or greater than, those which the Government of Venezuela grants to them for the purpose of stimulating operations. In fact, government revenue from mines, which in the economic period of 1927-1928 was Bs. 35,123,343, expanded to Bs. 46,980,271 in 1929, or an increase of Bs. 11,856,928 due to the greater production of petroleum.

The Minister of Fomento states, relative to accounting, in his report presented to Congress at its present session:

"An indisputable proof of the governmental cooperation which stimulates the investment of foreign capital in the operations of the exploiting companies is the amount of Bs. 62,787,358 which the exemptions from customs import duties on account of petroleum concessions amounted to during the civil year 1929.

"As the exploiting companies complete the stages of their exploration work and enter into the full period of development the exemptions from customs duties will slowly decrease."

During the year 1929 the exemptions from customs import duties granted to petroleum companies exceeded by Bs. 15,807,087 the total revenue reported by the division of mines in which the petroleum industry is included.

The situation of production of the petroleum industry in Venezuela constitutes a record on the way to surpass itself.

Turbo Drilling Will Reduce Costs

Analysis of Russian Drilling Costs Demonstrates Turbo Drilling 25 Per Cent Cheaper than Rotary and Time Can Be Reduced

By M. Gayman and M. Capelushnikov

Mining Engineer, Asneft Trust, U. S. S. R. — *Consulting Engineer, Asneft Trust U. S. S. R.*

To offset the universally increased costs of drilling oil wells the turbo system of drilling is the only notable expedient proved by continuous field operation. Its success in the Soviet oil fields during the last few years is a matter of record. It drills a straight hole because there is no distortion of the drill pipe. It has shown its ability to make footage faster than a rotary in the same well when adequate pump pressure is available. Its simplicity and efficiency reduce capital and operating costs.

Slush pump and mud are the only operating accessories of the turbo system of drilling. The mud pumped into the drill pipe operates the hydraulic turbine, which is direct-connected with the bit.

One desirable feature of rotary drilling is retained, namely, the cleansing of the hole by fluid. The regular drilling equipment also is used, but the table, its driving mechanism and the rotating drill pipe are dispensed with, thereby abolishing the undesirable features of rotary drilling (vide World Petroleum, May, pp. 191-194).

Equipment required for drilling with the turbo system (see Fig. 1) consists of the following:

1. Hoist for raising and lowering the drill pipe.
2. Steam engine or electric motor (not shown) of 75 to 100 h.p.
3. Plunger type mud pump with a capacity of 300-400 gallons per minute at a calculated pressure of 1000 lb. per sq. in.
4. Mud receiver with screen to prevent small slivers of stone and lumps of clay from getting into the mud fluid.
5. Tank and hose to lead the mud solution to the drill pipe.
6. Drill pipe.
7. Turbo drill.

The drill pipe in this system has no rotation, and there is no necessity for the swivel and rotor. A cap takes the place of the swivel, and a square rod is clamped in a yoke over the mouth of the hole. This last is necessary, because the rotation of the bit produces a reaction tending to turn the drill pipe in a direction opposite to the rotation of the bit. The yoke keeps the drill pipe stationary. The necessary load on the bit is obtained by means of the weight of all or part of the drill pipe to which the apparatus is connected.

The path of the mud solution is indicated in Fig. 1 by arrows. From the receiver the solution is pumped through the hose to the drill pipe. At the bottom of the hole its pressure drives the turbine wheel, washes out the bottom of the hole, cools the bit and, rising outside the drill pipe, returns the mud to the trough.

Thus it is evident the source of power for the turbo drill is the mud pump. In fact, the power of the turbo drill depends entirely upon the capacity of the pump. The drilling speed, or the r.p.m. of the bit, can be regulated by the quantity of mud solution fed to the turbine. The sound of the drill carried up the drill pipe and up the fluid is always a sure indication of how the apparatus is working. The sound can be clearly heard by the driller, because the deafening noise accompaniment of a rotary rig is wholly absent. In fact, conversation can be conducted in ordinary tones on the derrick floor of a turbo rig.

For ordinary effective work the turbine requires an average pressure of 120-150 lb. The pressure on the mud pump must therefore be higher by this amount than the pressure under similar conditions with rotary drills.

When drilling is restarted and the circulation in the hole is being reestablished, the pressure on the pump is somewhat greater on account of the inertia of the mass of the mud solution which has to be overcome before the fluid can acquire the desired velocity. After circulation has been reestablished, however, the pressure curve of the pump varies within a range of 20-50 lb., just as in rotary drilling. This has been demonstrated by several years of practice with the turbo drill.

The turbine assembly is enclosed in a shell and is attached to the bottom of the drill pipe, with the drill bit screwed into its lower end.

The drill pipe does not rotate, but serves only to conduct the mud down to the turbine and to give a load on the bit.

Distinctive Principles

In the Capelushnikov turbo drill the following principles are incorporated:

1. The fluid, which both cleans the hole and operates the turbine (the mud solution in this instance) passes only the turbine vanes. The rest of the mechanism is entirely insulated from the mud and works in an oil bath.

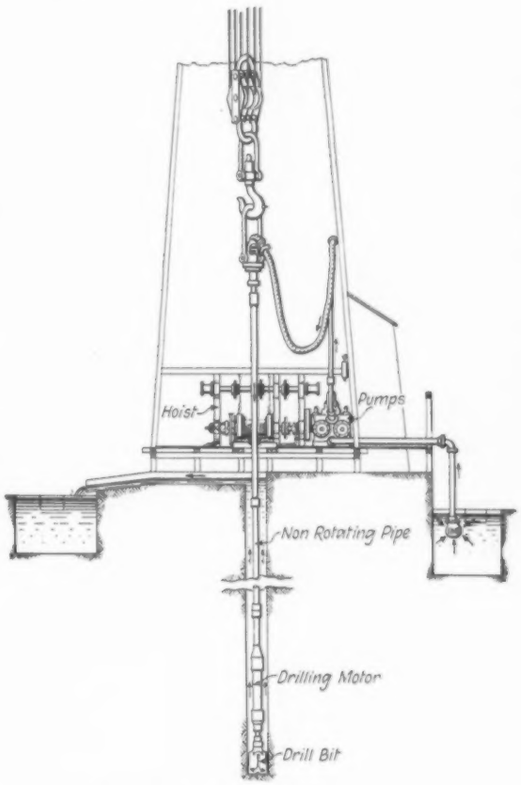


Fig. 1. Turbo Drilling Rig

2. The rotation of the turbine shaft is transmitted to the driving shaft of the drill by means of reduction gearing—giving the bit the speed required for the particular formation.

3. Emerging from the turbine, the mud solution flows down past the reduction gear box into the hollow vertical shaft. Thence it goes through the drill into the hole, where it performs the usual function of washing prior to bringing up the

drillings. Coming out of the openings in the bit this liquid is subject to a centrifugal force which separates the heavier particles of clay and sand and deposits them in a thin layer upon the walls of the hole, thus imparting a certain cohesion, so that a considerable diameter of hole can be worked without casing.

Vertical and horizontal sections of the Capelushnikov turbo drill are shown in Fig. 2. The upper end of the shell marked A is screwed on the lower end of the non-rotating drill pipe through which the mud solution is fed. This fluid passes the guide vane B fastened to the turbine shell and drives the hydraulic runner or wheel C. Discharging down past the reduction gear box by way of the annular space D, the fluid enters the hollow vertical shaft E and then follows the usual course to the bottom of the hole as previously noted.

The turbine is of the usual Jonvalle or Curtis hydraulic type. The power of the turbine runner or wheel is transmitted through the shaft F and reduction gears G to the vertical shaft E that emerges through a bushing. The entire reduction gear is hermetically sealed in a box. Where the power shaft E emerges from the gearbox at top and bottom there is a gland. No mud gets to any of the metallic bearing surfaces.

End pressure on the shaft, caused by the fluid pressure on the turbine vanes and by reaction from the pressure of the bit on the bottom, is taken up by the ball thrust J, while the gear assemblies rotate on ball bearings I and the turbine shaft runs in a ball bearing M.

Lubricating oil is fed through the turbine shaft and reduction gearing to the bearings. This oil is force-fed by means of a piston in the head of the turbine unit, the pressure being transmitted to the piston by the mud solution.

The gear reduction is so designed that by changing the ratios of the gears the revolutions per minute can be varied within the wide limits of 25 to 370 r.p.m., depending upon the nature of the material in which the drill is working.

The assembly of the machine can be accomplished right at the hole in not more than 30-40 minutes, requiring no specially trained mechanics, but readily done by the drill operating crew. All parts of the machine are easily replaced.

Efficient at All Depths

Operation of the turbine depends entirely on the difference between the pressure of the mud solution at the bottom of the drill pipe and the pressure outside. Hence follows the very important principle that the operation of the turbo drill is entirely independent of the depth of drilling, and this is a very important factor in drilling deep holes.

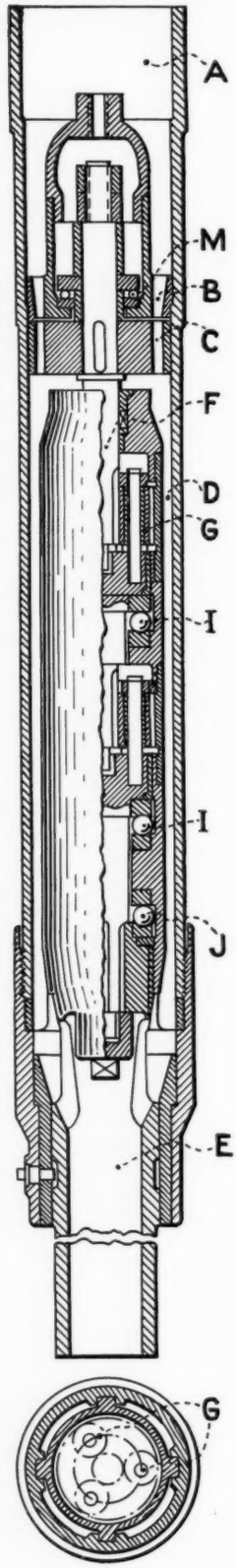


Fig. 2. Capelushnikov turbo drill

In this connection, let us examine the diagram in Fig. 3. Assume that, at a depth of hole D the gauge pressure of the pump shows A. Then the line ABCD will be the hydraulic gradient for this turbine: AB shows the fall in pressure in the rubber hose, swivel and drill pipe; BC represents the pressure drop in the turbine; CD sums the losses due to friction of the mud solution against the walls of the hole, the removal of broken-off material, etc.

Now, with an increase in depth, say to D_2, there is a proportional increase in resistance, with a consequent augmentation of the pump pressure. Thus the point A moves to A_2, and all the points of the gradient ABCD take corresponding places along a parallel gradient $A_2B_2C_2D_2$.

It can be seen that, while the increase in the friction loss for the drill pipe grows to A_2B_2—an increase of AA_2—and the loss outside the rod grows to C_2D_2—an increase of DD_2—, the pressure drop B_2C_2 in the turbine remains the same. In other words, the operation of the turbine is independent of the depth of drilling. Practical measurements have confirmed this conclusion.

Use of the turbo drill has shown the following four practical dimensions:

Outside Diameter of drill	Diameter of Hole drilled
11 in.	26 in.—14 in.
8 in.*	16 in.— 9 in.
6 in.	10 in.— 7 in.
4¾ in.	8 in.— 5 in.

*experimental model.

Three types of turbo drill are in use in the U. S. S.R., depending on the formation: (1) light, with single reduction for drilling in viscous soft materials, which stick to the bit; (2) medium, with double reduction for hard clays and hard sands; and (3) heavy duty, with triple reduction for hard formations. The length of the 8 in. drill with double reduction, including upper and lower connections, is only about 9 ft. The most widely used turbo drills in the U. S. S. R. are the 8 in. and 11 in. sizes, with double reduction.

With respect to wear, the only parts requiring renewal are the vanes of the turbine. This is a relatively trivial matter, because the cost is almost negligible when detachable vanes are used. The other parts, not being subjected to wear from the sand in the mud solution, serve between 3 and 4 years. However, with proper time allowed for the settling of the mud mixture and for the removal of the sand (which should be arranged in any event to lessen the wear on the pump, hose and drill pipe, as well as for a proper finish of the hole) the length of service of the drill is increased considerably and the amount of repairs correspondingly decreased.

Above have been described the main features of the turbine drill. The following points should now be noted:

Drills Straight Hole

1. The bit itself being the only external rotating member (the drill pipe itself being stationary) all tendencies to crookedness in the hole are eliminated. Everyone is aware of the difficulty of obtaining a perfectly straight hole with rotary drilling. A thorough knowledge of all the geological idiosyncrasies of the region, concentrated attention of the supervising engineer and an expert drill crew working with pride are essential to the production of a more or less straight hole by means of a rotary drill.

Straight holes are not at all common—only a small percentage of drilled holes giving this result. There are many instances of holes abandoned before completion on account of crookedness. As a rule, holes produced by rotary drills are crooked and give trouble in subsequent operation. The turbo drill on the other hand gives a straight hole.

Wells 45 and 53 in the Harosan oil region (Baku), drilled with turbo drills and now in operation, are considered exemplary from the point of view of the way the deep well pumps installed in them work. This can be accounted for only by correct location in the working tubes—which is almost impossible when the hole is not perfectly straight. In crooked holes the pump rod connections wear out very rapidly, while the plunger and cylinder wear unevenly on one side.

The adaptation of the turbo drill to operation with carbon bits and core drills increases its value for prospecting work.

Surveys of holes in the Baku region, to establish the deviation from the vertical, have demonstrated that, while the rotary drill gave various deviations from the vertical up to 25 degrees, the greatest deviation recorded at an equal depth on a turbo-drilled hole was 4 degrees—and at that the hole was straight in its deviation.

Better Water Shut-offs

2. The turbo drill makes possible better preparation for shutting off water in the hole. It is well known that successful shutting-off of water in the hole is conditioned upon the proper preparation of the hole for cementing or for forcing in the shoe of the water sealing pipe column. The negative results often obtained are explained by the difficulties of completing the work of preparation with the usual methods of drilling. Analysis of these difficulties resolves them into the principal one of crookedness of the hole.

In the case of the turbo drill, the conditions for shutting off the water are more favorable in view of the concentric disposition of the casing and of the shoe. In other words, the casing in no place touches the walls of the hole at crooked points, making weak spots for the water to break through. Concentricity gives a uniform and continuous ring, both as to diameter and length outside the casing, and provides a really solid adhesion between the entire surface of the shoe and the hole, when the shoe is pressed into the clay in the usual manner. It is also important to note that the turbo drill gives a more nearly cylindrical form to the hole, corresponding with the bit, than a rotary drill is capable of.

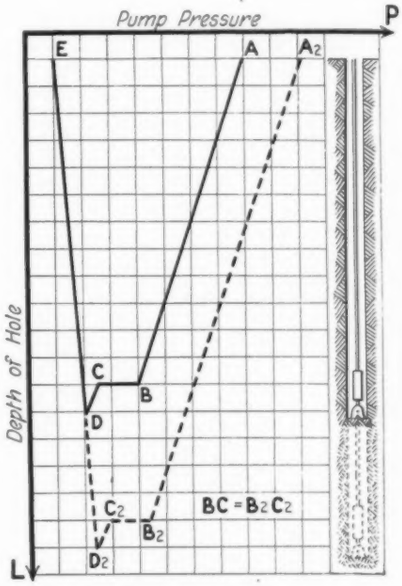


Fig. 3. Pressure of Mud Solution

Indicates the Formation

3. Changes in the formation encountered by the bit when using a turbo drill are easy to follow, because the sound of the breaking of the material is clearly transmitted upward through the mud solution and drill pipe without being blanketed by other sounds. Not only the sound from the bit, but also the vibration and reaction in the yoke, give to the sense of touch very accurate indications of changes in character of material encountered by the bit. This makes possible the compilation of an almost accurate geological log of the hole (accurate to within several inches).

With an ordinary rotary drill, such procedure is unthinkable, because of the danger of going near the rapidly rotating rods, rotors, chain, etc., while, moreover, the noise of the operating machinery completely shuts out the sound of the biting bit.

Speed Unaffected by Depth

4. Observation of the turbo drill at work in existing deep holes shows no diminution of power or loss of sensitivity at the cutting point. The non-rotating drill pipe insures safety against accidents during drilling operations.

The main thing of course is the desirability of maintaining the speed of rotation of the bit, which, in the case of the rotary drill, becomes impossible, because the increasing length of drill pipe necessitates cutting down the number of revolutions per minute. With the turbo drill the diameter of drill pipe can be kept to the minimum which provides strength enough to hold the weight of its full length and which gives least friction loss for the mud fluid descending through it. This obviates the necessity of providing many strengthening devices which complicate the work with a rotary drill. The turbo drill generally tends to lighten all operations.

5. Better utilization of power and a higher efficiency of the entire plant are made possible by the turbo drill, as compared with the rotary drill. The absence of a rotating drill pipe obviates friction losses inevitable in any rotating system and renders possible the increase of revolutions per minute of the bit without the big loss of power that occurs in the rotary (vide World Petroleum, May pp. 191-192). 192).

6. The drill pipe serving solely to deliver the mud solution to the turbine and having to withstand only a small turning moment because the power of the turbo drill is only 12 to 15 h.p., the wall thickness can be reduced and the joints lightened, yet with increased service life. Besides, there is absolutely no need for rubber protectors when working with the turbo drill in cased hole.

Reduced Costs

7. A reduction in capital cost and in operating costs accompanies the use of the turbo system of drilling.

The most expensive parts of a rotary drilling outfit are the drill pipe, rotor, swivel and other parts which wear out rapidly in the rotary drilling process. The repair and depreciation charges on this equipment are much higher for rotary drilling than for the turbo drill. The respective lengths of service are indicated by the fact that in the Baku region there have been frequent cases where almost entirely useless rotors were reclaimed for service with the turbo drill. This indicates that the depreciation of the equipment with the turbo drill can be spread over a longer period of time.

The following data from U.S.S.R. practice give a line on the relative costs of

the turbo and rotary drilling system respectively.

During the fiscal year 1927/28 over 20,000 feet were drilled by the turbo system in the Azneft fields of Baku. Notwithstanding this limited amount of drilling and the novelty of the system (which made the initial expense much greater than at a later period) the cost of drilling per running foot was $1.00 less for the turbo drill than for the rotary.

In the fiscal year 1928/29 about 40,000 ft. were drilled by the turbo system, and the saving per running foot was 17 per cent compared with the cost of drilling by rotary drills.

Analysis shows the following detailed composition of the savings effected:

1. Saving in capital outlay for equipment, including depreciation	25%
2. Saving in repairs (chain, hoist, cable rod)	22%
3. Saving of casing	22%
4. Saving in power	11%
5. Saving in labor	13%
6. Saving due to fewer repairs and easier servicing	7%
Total	100%

In determining the above components, the following points were taken into consideration: (a) crew consists of four men instead of the usual five for a rotary drill in Russia; (b) the electric power input was 65 per cent less than for a rotary drill; (c) for the initial equipment, one or two boilers (compared with three for a rotary) of 1,250 sq. ft. heating surface are sufficient—and, of these two, one is a spare.

At present, the drilling speed with the turbo drill in the U.S.S.R. is the same as with the rotary drill, because the mud pumps available in the Baku district are not very powerful. It may be assumed that, in the near future, drilling speeds will be increased beyond those of the rotary drill, and the saving will grow correspondingly greater. Considerably higher drilling speeds have been successfully demonstrated by the turbo drill when ample pump capacity has been available.

Safety

8. With respect to safety of labor, the turbo drill has the important advantage that the dangerous machinery is abolished. The operation is noiseless, and the crew is entirely free from the necessity of giving the concentrated attention demanded by the equalizer and rotor in rotary drilling.

Progress

9. The first turbo drill was tested in the U.S.S.R. in August, 1923, on Well 57 in the second Surahan field. The results were so satisfactory that the special commission decided to adopt the system immediately.

Developments were, as usual, slow in the beginning, but progress has been made with each succeeding year, as can be seen from the following table:

Number of running feet drilled with turbine drills:

1926-27	13,500 ft.
1927-28	22,000 ft.
1928-29	40,000 ft.

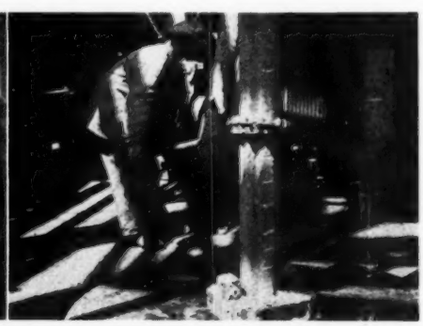
A considerable increase is taking place this year.

Up to the present, the deepest drilling with the turbo drill has been 3450 ft. in the Surahan oil fields, Baku, U.S.S.R. This is due, however, to the fact that there is little, if any, deeper drilling in this region.

Urgency having governed the scheduled increase of production from the Russian oil fields, preference has been given by the Soviet oil trusts to rotary drilling equipment on which quick delivery could be obtained from the United States. Within the limitations imposed by the restricted machine shop facilities of Russia —with the demands far exceeding the possibilities of production—turbo drills have been increasingly supplied to the Russian oil fields. Arrangements have been made to increase the output in that country, and plans are being laid to manufacture the turbo drill in the United States where its introduction is sure to effect a big change in drilling methods.

Capelushnikov 4¾ in. drill cut open for demonstration

Hydraulic runner being inserted in 11 in. turbo drill



Driller "feeling" the work of the bit by resonance